



Catalogue no. 91F0015MIE — No. 007

ISSN: 1205-996X

ISBN: 0-662-39534-4

Research Paper

Demographic documents

Research on Modifications to the Method of Preliminary Estimates of Interprovincial Migration

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June 2005

Published by authority of the Minister responsible for Statistics Canada

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Note of appreciation

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Aussi disponible en français (n° 91F0015MIF au catalogue).

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1. Introduction

Migration is an important issue for several reasons. First, it affects the size and composition of the population of the areas of origin and of destination; thus, it comprises a fundamental element of the demographic, social, and cultural structure of a nation and its regions. Second, a large portion of migration is labour force flow that represents the transfer of different skills. As a result, it has significant repercussions for the economic performance of both sending and receiving areas. Finally, migration is a major factor in determining government programs, such as revenue transfers and cost-sharing programs among various levels of government. In response to the importance of internal migration issues, the Population Estimates Program at Statistics Canada has been producing migration estimates using administrative sources of data. As such, there are two versions of migration estimates currently available at Statistics Canada: preliminary (*P*) and final (*F*).

The *P* and *F* estimates are based on the monthly Child Tax Benefit (CTB) file and the annual income tax return file, respectively; these two files are provided by Canada Customs and Revenue Agency (CCRA). The CTB is an income supplement provided by the federal government to those families with children of less than 18 years of age, and under a certain income threshold. The main advantage of the CTB and the income tax return data is the reasonably good quality of coverage and accuracy. They are also a timely source of data: the CTB files are after the reference date by about four months while the income tax return file lags the CTB files by about 12 months. Hence, these data sources represent a timely and continuous data base for population estimates.

The *P* estimates of internal migration are produced by Demography Division. The CTB file is adjusted to account for the coverage of children aged 0 to 17 years, and the differential propensity to migrate between families receiving and not receiving this benefit (Statistics Canada, 2003). The monthly CTB-based migration estimates, of reasonably good quality, have been available since the month of July 1993. Prior to this date, family allowance files were used for the purpose of estimates (Bédard, 1994; Bédard and Michalowski, 1994). The coverage rate of the CTB file, defined as the ratio of the number of children actually receiving CTB to the total number of children under 17 years of age, varies more by province and territory than it does over a time period. Table 1 presents the coverage rates of the CTB file for the provinces and territories in 1998/99. They vary from a low of 69.2% in the Yukon Territory to a high of 86.2% in Prince Edward Island, with an average and standard deviation of 78.4% and 6.3%, respectively.

The *F* estimates are produced by Small Area and Administrative Data Division (SAADD). The annual data of income tax returns are used to develop these estimates. They are subsequently disaggregated into monthly estimates in accordance with monthly schedules of the *P* estimates. Development of the *F*

estimates of migration involves four main steps (SAADD, 2002): (1) Geocoding of income tax records; (2) estimating non-filing dependents of tax filers, by age group and sex; (3) identifying the number, age and gender of migrant tax filers; and (4) adjusting for the population not covered by the CCRA taxation system. Coverage of tax filers, defined as the ratio of SAADD’s population “at-risk-to-migrate” to the total number of population estimated by Demography Division, also varies among provinces and territories, and over time. Table 1 includes the coverage rates of tax filers for 1998/99. It shows the rate changes from 81.9% in the Yukon Territory to 92.7% in Prince Edward Island, with an average and standard deviation of 88.0% and 3.6%, respectively. When compared to the CTB coverage rates, the rate of tax filers is higher and its variance is smaller.

Table 1. Coverage rates (%) of CTB file (population 0 to 17 years and income tax file (total population), Canada, provinces and territories, 1998/99

Province/territory (1)	CTB file (2)	Income tax file (3)
Canada	75.3	86.9
N.L.	84.8	92.1
P.E.I.	86.2	92.7
N.S.	82.1	88.1
N.B.	84.3	91.9
Que.	80.0	88.8
Ont.	70.3	85.6
Man.	82.4	89.9
Sask.	83.0	90.7
Alta.	73.9	86.3
B.C.	73.6	83.3
Y.T.	69.2	81.9
N.W.T.	70.7	84.9

Note: The coverage rates of income tax file indicate the “at-risk-to-migrate” population defined as those who filed tax returns for two consecutive years and their dependents.

Source: Statistics Canada 2003.

The *P* estimates of migration differ from the *F* estimates of migration in that a different time frame is used to define a move. A person can have more than one interprovincial move according to the CTB-based data, whereas for the same person, in an extreme case, no move is recorded based on the annual income tax data. Consequently, the two estimates have shown considerable discrepancies, (although other causes may also contribute to this disagreement). In general, the number of migrants from *P* estimates exceeds those from *F* estimates (Statistics Canada, 2003). For the period from 1993/94 to 2000/01, the proportion of *F* estimates is about 76% to 86% of the *P* estimates. A long-standing issue

facing the Population Estimates Program is how to reduce the discrepancies between the *P* and the *F* estimates of migration (Wilkinson, memo, 2000).

The objectives of the present report are twofold. The first is to describe the discrepancies between *F* and *P* estimates. The second objective is to introduce and describe six approaches to decrease the discrepancies using the regression method, simple time series analysis, and the U.S. Bureau of Census method. The organisation of the report is as follows: Section 2 provides an overview of the discrepancies between the two versions of interprovincial migration estimates based mainly on the index of dissimilarity. Section 3 describes the approaches that are used to obtain the modified preliminary migration estimates. Section 4 describes further estimates based on one of the methods (Method 3) specified in Section 3. Conclusions are presented in section 5.

2. Discrepancies between the two estimates of migration

Before dealing with the issue of reducing the discrepancy between the two estimates, it is worthwhile to identify how these two estimates of interprovincial migration differ. We first look at the discrepancies between the two estimates for out- and for in-migration. The discrepancy is measured as a percentage difference (*PD*) and is defined as

$$PD = \frac{\text{Preliminar } y - \text{Final}}{\text{Final}} \times 100$$

Thus, a positive *PD* indicates that the *P* estimate is greater than the *F* estimate, and a negative value reflects the opposite. Table 2 presents the summary statistics (average and standard deviation) of this measure for the provinces and territories using the data between 1993/94 and 2000/01 (96 cases). It shows that the eight-year average of *PDs* for out-migration ranges from a high of 26.0% in Newfoundland and Labrador to a low of 14.8% in the Northwest Territories. This suggests that *P* estimates of out-migration are about 15% to 26% higher than *F* estimates in the provinces and territories. Based on the standard deviations (column 2), the variation of *PDs* is more pronounced for small provinces and territories than for large provinces. For in-migration the average of *PDs* varies between 47.8% in Newfoundland and Labrador and 17.3% in Alberta. Overall, with the exception of Ontario, Alberta and British Columbia, the average of *PDs* for in-migration is higher than that for out-migration in the rest provinces and territories. This implies that more discrepancies are observed between the two versions of estimates for in-migration than for out-migration.

There is no clear pattern with respect to *PDs* of net migration. A positive *PD* is observed for about 51% of the 96 cases in the period 1993/94 to 2000/01. This suggests that, for about half of the cases, *P* estimates of net migration are greater than *F* estimates; the other half show the opposite. The average of *PDs* for net migration in this eight-year period ranges from a low of -66.5% in Ontario to a high of 115.6% in Prince Edward Island, with a much larger standard deviation, in comparison to that for out- and in- migration. This indicates that the distribution of net migration among the provinces and territories tends to be dispersed more from the average than that of out- and in- migration. One of the implications, therefore, arising from this table is that modelling net migration will be more challenging than modelling out- and in- migration.

Table 2. Average and standard deviation (sd) for the relative percentage difference (%) between preliminary and final annual estimates of out-, in- and net migration, 1993/94 to 2000/01

Province/territory	Out-migration		In-migration		Net migration	
	average	sd	average	sd	average	sd
N.L.	26.0	9.3	47.8	11.7	- 1.9	21.5
P.E.I.	16.5	10.8	19.6	9.8	115.6	306.9
N.S.	16.1	6.6	20.1	7.7	- 56.8	131.0
N.B.	22.4	9.4	29.5	8.0	- 48.3	69.4
Que.	23.3	7.6	25.0	6.5	24.5	24.8
Ont.	24.3	5.2	21.1	9.3	- 66.5	152.2
Man.	21.3	8.0	34.8	8.4	- 29.9	21.9
Sask.	25.6	6.7	37.2	11.3	- 13.1	46.6
Alta.	24.1	4.9	17.3	7.8	100.3	227.1
B.C.	22.6	10.9	21.9	5.5	7.7	42.5
Y.T.	23.1	12.1	24.1	6.3	25.4	64.9
N.W.T.	14.8	17.7	21.5	8.6	114.5	352.2

Source: Statistics Canada, Demography Division.

To look at how a specific migration flow, with origin and destination, differs between the two estimates, we use the index of dissimilarity (*ID*) to examine the overall discrepancy in distribution between the preliminary and the final migration flow matrices in the same year, and, between two consecutive annual migration matrices of the *F* estimates. Specifically, two steps are taken in the calculation of this index.

1. Calculate the percentage distribution of migration in migration matrices *a* and *b*, respectively. Matrices *a* and *b* are the preliminary and the final migration matrix, respectively, or the matrix in year *t* and in year (*t-1*) for the final migration series. This calculation is performed by dividing

the number of migrants of each cell by the total number of migrants of the matrix and then multiplying by 100.

- Calculate the index. It is based on the absolute differences between the *percentages* for each cell of the migration matrices *a* and *b*. The *ID* between the two migration matrices is then one-half of the sum of the absolute differences between the respective cells of the matrices (Shryock and Swanson, 2004). The formula may be written as follows:

$$ID = \frac{1}{2} \sum_{i,j} |m_{ij}^a - m_{ij}^b| \quad (1)$$

where m_{ij}^a and m_{ij}^b represent the percentage of migrants of a cell for interprovincial migration matrices *a* and *b*, respectively. For example, if the *ID* is equal to 10%, it means that 10% of the migrants in matrix *a* will have to be transferred to different cells (here province or territory) in order to make their distribution the same as that of migration matrix *b* (Duncan and Duncan, 1955).

Table 3 shows the index between the preliminary and the final origin-destination migration flow matrix (column 2), and between two consecutive final migration matrices (column 3). For the preliminary vs. final migration flows, the index ranges from 3.4% to 6.1%, with an average of 4.2%. With the exception of the 6.1% in 1999/2000, it varies from 3.5% to 4.7%. This suggests that, although there are relatively large discrepancies between the two versions of out- or in-migration, as discussed above, the discrepancies in distribution as a percentage between the two estimates is relatively small.

Table 3. Index of dissimilarity (*ID*) between final and preliminary migration matrices, and between two consecutive final migration matrices, 1993/94 to 2000/01

Year (1)	<i>ID</i> between <i>F</i> and <i>P</i> (2)	<i>ID</i> between <i>F</i> s (1-year lag) (3)
1993/94	4.0	2.7
1994/95	4.1	3.4
1995/96	3.5	3.5
1996/97	4.0	5.6
1997/98	3.4	5.9
1998/99	4.7	5.1
1999/00	6.1	3.3
2000/01	3.9	2.9
average	4.2	4.1
sd	0.9	1.3

Source: Statistics Canada, Demography Division.

Column 3 of Table 3 shows the index calculated using two consecutive annual migration matrices of F estimates. For example, the 1993/94 index of 2.7% is calculated using the 1993/94 and the 1992/93 final migration matrices. The index ranges from 2.7% to 5.9%, with an average of 4.1%. Again, the indices for the eight-year period demonstrate that the origin-destination migration flows are relatively stable, and the distribution as a percentage is close. Over time, this relative stability of final origin-destination flows suggests that a previous year matrix of F estimates could be used for derivation of a modified migration matrix.

3. Six methods of deriving modified migration

Our purpose is, not only to reduce discrepancies between P and F estimates of out- and in-migration, but also to reduce discrepancies between the two estimates of net migration. Six methods have been tested for this purpose.

3.1 Deriving modified out-migration and its flow matrix

The first method involves two steps to derive of preliminary modified (PM) estimates of out-migration. In the first step, a simple regression between F and P estimates of province and territory outflows is used to derive PM estimates of out-migration. In the second step, PM estimates of out-migration by province and territory are converted into an origin-destination flow matrix by using an out-migration (origin) constrained modeling method (see Appendix A for details).

Table 4. Average and standard (sd) of absolute percentage difference (%) for preliminary modified (PM) estimates and for preliminary (P) estimates, out-migration, 1994/95 to 2000/01

Year	$ PM-F /Fx100$		$ P-F /Fx100$	
	average	sd	average	sd
(1)	(2)	(3)	(4)	(5)
1994/95	9.48	5.06	31.12	6.06
1995/96	2.54	2.18	22.91	3.62
1996/97	6.96	4.44	20.62	8.32
1997/98	5.81	4.72	16.67	6.84
1998/99	5.79	6.30	20.33	9.20
1999/00	7.76	5.54	16.10	7.15
2000/01	5.59	5.26	22.30	7.80

Source: Statistics Canada, Demography Division.

The simple regression method has the following procedure: annual F estimates of out-migration are regressed on annual P estimates of out-migration using three-year pooling data; also, the regression is forced to have a zero constant. PM estimates are calculated assuming a one-year lag in data availability (the usual SAADD production schedule). Suppose we would like to derive PM estimates of out-migration for 1995/96. We use the previous three-year data (1994/95, 1993/94 and 1992/93) to obtain the annual regression parameter. The annual regression parameter is then used to obtain PM estimates of out-migration for 1995/96. Table 4 shows that the summary statistics for PM out-migration estimates are far better than P estimates of out-migration.

In the second step, we use a one-year previous interprovincial migration matrix of F estimates to redistribute annual PM out-migration. The redistribution results in a modified origin-destination migration flow matrix. This migration matrix is evaluated against the matrix of the F estimates using the percentage of migrants misallocated ($PMIS$). $PMIS$ is a goodness-of-fit statistic, indicating the percentage of migrants who would have to be “displaced” to other provinces and territories in order for the modified origin-destination matrix to match the flow matrix of F estimates. $PMIS$ shows that the modified migration matrices are much closer to the matrix of F estimates than to the migration matrix of the P estimates (see Table 5).

Table 5. Percentage of migrants misallocated ($PMIS$) between migration matrices, using origin-constrained model, 1994/95 to 2000/01

Year	$PMIS$	
	Matrices PM and F	Matrices P and F
(1)	(2)	(3)
1994/95	5.0	15.1
1995/96	3.1	12.3
1996/97	5.2	10.7
1997/98	5.8	8.6
1998/99	5.1	10.7
1999/00	3.8	10.7
2000/01	3.1	11.1
average	4.4	11.3
sd	1.1	2.0

Source: Statistics Canada, Demography Division.

Results are further analysed by looking at the numbers for net migration. Table 7 shows that when PM and P estimates are compared to F , in 66% of the cases, PM compares better than or close to the P estimates (a case here means net migration for a particular province or territory in a particular year: the

total number of cases is 84, i.e., 12×7). However, the actual improvement is achieved in only 51% of cases.

3.2 Deriving modified in- and out-migration separately

In the second method, the regression method is used to derive preliminary modified in-migration (*PMI*) and preliminary modified out-migration (*PMO*) separately. Their difference serves as an estimate of preliminary modified net migration (*PMN*). Specifically, *PMI* and *PMO* are derived based on the annual regression parameter, which is estimated using three-year pooling and the zero-constant-regression procedure. To derive *PMI*, the *F* estimates of in-migration are regressed on the *P* estimates of in-migration; to derive *PMO*, the *F* estimates of out-migration are regressed on the *P* estimates of out-migration.

Table 6. Average and standard deviation (sd) of absolute percentage difference (%) for preliminary modified (*PM*) estimates and for preliminary (*P*) estimates, *in-migration*, 1994/95 to 2000/01

Year	$ PM-F /Fx100$		$ P-F /Fx100$	
	average	sd	average	sd
(1)	(2)	(3)	(4)	(5)
1994/95	12.53	10.26	34.02	13.22
1995/96	5.09	6.12	28.02	9.68
1996/97	6.41	5.98	26.27	11.37
1997/98	7.88	3.96	17.22	9.04
1998/99	6.47	7.13	23.57	10.82
1999/00	9.34	6.59	25.53	11.43
2000/01	8.35	7.55	25.57	10.68

Source: Statistics Canada, Demography Division.

For each year being estimated, total *PMI* and total *PMO*, across all provinces and territories, are not necessarily identical. In such situations, totals are constrained to be the same numbers by allocating one-half of the difference to *PMI* and the other half to *PMO*. These differences are then allocated to individual provinces and territories on a proportional basis. Similar to the degree of improvement in *PMO*, *PMI* is far better than *P* estimates of in-migration (see Table 6). The results of *PMN* using this method are evaluated against the net migration of *F* and *P* estimates. As indicated in Table 7, this method of estimating the modified net migration results in 46% of cases being better than the *P* estimates of net migration, but 54% of cases being worse than the *P* estimates of net migration.

Table 7. Classification of provinces and territories based on results of the six methods for modified net migration, 1994/95 to 2000/01

Year	Redistribution of <i>PMO</i> Method 1			Regression of "in" and "out" Method 2			Regression of "net" Method 3			EWMA Method 4			U.S.Census Bureau method Method 5			Regression of "first difference" Method 6		
	B ¹	C ²	W ³	B ¹	C ²	W ³	B ¹	C ²	W ³	B ¹	C ²	W ³	B ¹	C ²	W ³	B ¹	C ²	W ³
1994/95	5	2	5	8	1	3	8	4	0	4	2	6	4	1	7	4	3	5
1995/96	6	2	4	3	3	6	5	7	0	3	0	9	3	1	8	3	2	7
1996/97	5	0	7	5	1	6	6	4	2	3	2	7	6	6	0	7	1	4
1997/98	3	4	5	5	2	5	6	6	0	2	3	7	5	7	0	5	1	6
1998/99	6	2	4	6	2	4	6	6	0	3	0	9	2	3	7	4	2	6
1999/00	10	1	1	6	4	2	5	7	0	9	1	2	9	1	2	8	2	2
2000/01	8	2	2	6	3	3	6	6	0	7	2	3	7	2	3	7	0	5
total	43	13	28	39	16	29	42	40	2	31	10	43	36	21	27	38	11	35
%	51	15	33	46	19	35	50	48	2	37	12	51	43	25	32	45	13	42

Notes:

1. B – better, *PMN* migration is better than *P* estimates of net migration when $|F_n - PM_n| / |F_n|$ is less than $|F_n - P_n| / |F_n|$, F_n , P_n , and PM_n are final, preliminary and preliminary modified net migration, respectively.
2. C – close, difference between the two terms, $|F_n - P_n| / |F_n|$ and $|F_n - PM_n| / |F_n|$ is not greater than 0.10.
3. W – worse, the difference between the two terms, $|F_n - P_n| / |F_n|$ and $|F_n - PM_n| / |F_n|$ is greater than 0.10.

Source: Statistics Canada, Demography Division.

3.3 Deriving modified net migration directly from regression

In this method, modified net migration is obtained directly from regressing the final net migration on preliminary net migration. As in Method 1 and Method 2, the regression is based on the 3-year pooling data approach. Due to the nature of the data on the number of net migration, the constant parameter of the regression equation always equals to zero.

In Table 7, when compared to F estimates (with the exception of two cases), *PMN* migration is either better than or close to the preliminary series of net migration. Specifically, in 50% of the cases, *PMN* migration is better than the P estimates of net migration; in 48% of the cases, *PMN* migration is close to the P estimates of net migration. Further analysis shows that in most cases the difference (cases of the category “close”) between the two terms, $\frac{|F_n - P_n|}{|F|}$ and $\frac{|F - PM|}{|F|}$ lies in a narrow range between 0.01 and 0.08. Therefore, discrepancies arising from this method, compared with those from the previous two methods are much smaller. Overall, judging from the *PMN* estimates, this method is better than Method 1 and Method 2.

3.4 Estimating net migration using the exponentially weighted moving average model

Another class of models, which is based on time series data and is often used for estimation, is called the moving average model. One such model is the exponentially weighted moving average (EWMA) model (see Appendix B for details). In using the EWMA approach, we assume that a reasonably good estimation of net migration relies more on the most recent values than on earlier ones. We use only F estimates of net migration to obtain PMN migration series. The value of the weighting parameter " α " is given 0.7.

Table 7 indicates that, relative to F estimates, only 37% of the cases are better than P estimates of net migration. The performance of the method varies among the provinces and territories and over the seven-year period. The best results are found in the year 1999/2000 in which there are eight provinces and territories showing better PMN estimates than the preliminary net migration. In contrast, the year 1998/99 shows the worst performance (ten provinces have worse PMN estimates relative to P data of net migration). We also tested the use of other values of " α ", but the results are unsatisfactory.

For each year under estimation, the total number of the modified net migration across all provinces and two territories is not necessarily zero. In such circumstances, totals are constrained to zero by allocating the discrepancies to individual provinces and territories on a proportional basis.

Two features of this method prevent us from improving the estimates. First, obtaining the values of " α " is a trial-and-error process and, therefore, in general, the EWMA approach is a heuristic procedure. Second, the approach relies completely on past values, and often is unable to predict net migration with reasonable accuracy when the data series comes to a turning point. In other words, only when the time series data on net migration demonstrates a reasonable stability can this approach be appropriate in estimating net migration.

3.5 Estimating net migration using the U.S. Bureau of Census approach

For population under the age of 65 years, the U.S. Census Bureau estimates internal migration through the address matching of federal tax returns for successive years. For those aged 65 years and over, the Bureau uses county-level information on the number of medicare enrollees from the Health Care Financing Administration (U.S. Census Bureau, 2000). Based on the U.S. Census Bureau approach, a similar method can be established for Canada's estimates of internal migration.

(1) Calculate the net migration rate. For a particular geographical area, using the number of in-migrants and out-migrants, as well as the number of “at-risk-to-migrate” persons provided by SAADD, the net migration rates for provinces and territories were calculated.

(2) Derive the net number of migrants. The net migration rates for provinces and territories are then applied to the preliminary population estimates (available from Demography Division) at the beginning of the migration period.

As in Method 4, the total number of modified net migration for each year under estimation across all provinces and two territories is not necessarily zero. In such circumstances, totals are constrained to zero by allocating the discrepancies to individual provinces and territories on a proportional basis.

Table 7 indicates that, overall, 43% of the cases (the modified net migration) are better than the P estimates of net migration. The performance of this approach varies over the seven-year period. It depends on the consistency of the previous year’s net migration rates (derived from income tax files) to the migration patterns of the reference year.

3.6 Estimating net migration using the first difference regression

This proposed method is based on regressing the first difference of final net migration against that of preliminary net migration. In other words, the difference of final net migration between two consecutive years, year t and year $t-1$, is regressed against the difference of preliminary net migration between year t and year $t-1$. This is the first difference regression method. The modified final net migration is obtained using the regression parameter (for details, see Appendix C).

The results indicate that when the regression is based on the 24 observations, the modified net migration in 45% of the 84 cases is better than the P estimates, and the rest is either close (13%) or much worse (42%). On the other hand, when the regression is based on removing the outliers, slightly better results are shown. Specifically, 48% of cases are better than the P net migration, 14% are close, and 38% are worse (or 52% are worse than the P estimates of net migration). Overall, the modified estimates of net migration using this method are not satisfactory since its performance is not as good as that of Method 3

4. Further estimates based on Method 3

4.1 Extension of Method 3

In Method 3, *PMN* is obtained using the regression method. In this section we would like to demonstrate that we can have the estimates of *PMI* and the origin-destination migration matrix. We obtained *PMO* in the first method by regressing the final out-migration against the preliminary out-migration. Based on *PMN* and *PMO* estimates, we obtained *PMI* by summing *PMN* and *PMO*. The summary statistics are included in Table 8 - when comparing *PMI* with *F* estimates of in-migration. Comparing the summary statistics of *PMI* by this extension (Table 8) with that using the regression method (Table 6), except for 1997/98, the average absolute difference for *PMI* migration using this approach, is smaller than those using the regression method; while the summary statistics are approximately similar for the year 1999/2000. Therefore, we have derived the best possible modified estimates for net-, out-, and in-migration through Method 3 and its extension.

Table 8. Average and standard deviation (sd) of absolute percentage difference (%) for preliminary modified (*PM*) estimates and for preliminary (*P*) estimates, *in-migration*, 1994/95 to 2000/01

year	<i>PM-F</i> / <i>F</i> x100		<i>P-F</i> / <i>F</i> x100	
	average	sd	average	sd
(1)	(2)	(3)	(4)	(5)
1994/95	11.90	7.15	34.02	13.22
1995/96	4.53	3.95	28.02	9.68
1996/97	3.99	3.66	26.27	11.37
1997/98	8.64	5.15	17.22	9.04
1998/99	6.46	5.88	23.57	10.82
1999/00	10.99	6.62	25.53	11.43
2000/01	7.31	5.83	25.57	10.68

Note: *PM* in-migration is the sum of *PMO* and *PMN*.

Source: Statistics Canada, Demography Division.

Using an origin-destination (also called doubly) constrained model, we redistribute *PMO* and *PMI* derived from this further estimate to obtain the origin-destination migration flow matrix. These *PM* matrices are evaluated against the *F* migration matrix. Table 9 shows the evaluation results based on the percentage of migration misallocated. It indicates that, for seven years, *PMIS* between the *PM* and the *F* migration matrices is considerably lower than that between the *P* and the *F* migration matrices. The *PMIS* between *PM* and *F* migration matrices in Table 9 ranges from a low of 2.8% to a high of 5.6%, with an average of 4.2%; whereas, *PMIS* between the *P* and *F* matrices varies between 8.6% and 15.1%,

with an average of 11.3%. It, therefore, suggests that the *PM* migration matrix based on the origin-destination constrained model is much closer to the final matrix than the preliminary is to the final matrix. Compared to *PMIS* in Table 5, the summary statistics of *PMIS* using the origin-destination constrained model are slightly better.

Table 9. Percentage of migrants misallocated (*PMIS*) between migration matrices, using the origin-destination constrained model, 1994/95 to 2000/01

Year	PMIS	
	Matrices <i>PM</i> and <i>F</i>	Matrices <i>P</i> and <i>F</i>
(1)	(2)	(3)
1994/95	5.6	15.1
1995/96	2.8	12.3
1996/97	4.2	10.7
1997/98	4.2	8.6
1998/99	3.9	10.7
1999/00	5.0	10.7
2000/01	3.9	11.1
average	4.2	11.3
sd	0.9	2.0

Note: The *PM* migration matrix is estimated using 1-year previous final migration matrix to redistribute annual *PM* out- and *PM* in-migration.

Source: Statistics Canada, Demography Division.

4.2 Replacing the final estimate of net migration with the new method final net migration

Method 3 also was tested by using the new method *F* estimates of net migration data. These data are based on the calculation of the current method “inflation factor”; however, the extreme inflation factors are modified with the national average, rather than the individual provincial averages (see Wilkinson, 2003).¹

Evaluation indicates that 48% of cases are better than the *P* estimates of net migration, and 52% of cases are close to the *P*. This result is quite close to that of using the *F* estimates of net migration with Method 3.

Similar results are obtained when Method 1 and Method 2 are tested using the new method estimates of migration as a reference source (He and Michalowski, 2003a).

1. This method was adopted by SAADD for the production of estimates of internal migration starting with the 2001/02 period.

5. Conclusions

The application of the simple regression method to derive *PMO* (Method 1) resulted in data much converged to the final series of estimates of out-migration rather than to the ones based on the CTB-data. When these estimates were converted into an origin-destination migration matrix, flows were not in our range of expectation. In other words, the regression-based *PMO* and its subsequent redistribution provide us with reasonably good estimates of out-migration, but unsatisfactory net migration estimates. As our ultimate goal is to obtain better convergence of the preliminary and the final net migration data, we have tested five other feasible approaches to directly estimate net migration (*PMN*). The underlying idea is, that once we have good estimates of net migration, the migration flow matrix can be modelled.

In Method 2, modified net migration is the result of the difference between *PMI* and *PMO*. In Method 3, modified net migration is obtained directly by regressing final net migration on preliminary net migration. In Method 4, modified net migration is obtained using the EWMA model based on *F* estimates of net migration data. In Method 5, net migration rates are derived from one-year lagged income tax return data and applied to *P* estimates of population. In the last method, Method 6, modified net migration is derived by regressing the first difference of net final data against the first difference of net preliminary data.

We have concluded that the best results for *PMN* migration are obtained from the direct regression of *F* estimates of net migration on *P* estimates of net migration. The worst results are from the EWMA approach. All other methods produce results between these two extremes.

A common methodological feature for the first three methods is the use of the simple regression model based on preliminary and final migration data. These three methods perform better relative to the other three methods. One of the reasons may be the simultaneous reliance on final and preliminary data, whether it is only out-migration data, out-migration and in-migration data, or the balance of the two in the form of net migration data.

Method 3 works best among the three regression methods. Not only do 50% of the cases show better *PMN* migration estimates; as well, 47% of the cases have *PMN* close to preliminary net migration. These 47%, although being worse, display a small margin of deterioration when compared to the other methods. Method 2, deriving *PMI* and *PMO* separately, does not work well. In using Method 2, we noticed that the degree of the discrepancies between preliminary and final series of data for in-migration and for out-migration is different. Using the regression model to derive modified in-migration and modified out-migration separately, and then combining the two to obtain the modified net migration,

does not work for most of the cases - better modified in-migration and out-migration cannot guarantee better modified net migration. Method 1 delivers modified net migration estimates which are more consistent with F estimates than those obtained through Method 2 but still with a lower degree of consistency than the results of Method 3.

The relatively worst results, obtained when applying Method 4, suggest that relying exclusively on final data time series is not appropriate for deriving modified net migration. It seems that the time series of the final migration data might not be the best predictor of the migration pattern for the reference period. This is especially true when the migration pattern undergoes abrupt change.

The performance of Method 5 indicates that the migration patterns arising from only the taxfilers and their dependents (“unadjusted” income tax data) do not fully reflect the patterns of total population in the reference period. This conclusion is relative to the performance of the other five methods. Moreover, with the exception of Ontario and Quebec, net migration rates for most provinces and territories are too fluctuating to be appropriate for deriving modified net migration estimates. The performance of Method 6 cannot match that of Method 3 because the percentage of cases belonging to the “worse” category is much higher.

Based on the above evidence from the 1994/95 to 2000/01 period, it seems that the methods in which final and preliminary migration data are combined to estimate the preliminary net migration (Method 3) are the best approach to achieve improved convergence between the P and the F estimates of internal migration for the Population Estimation Program. This approach allows for the “smoothing” of some erratic patterns displayed by CTB-based estimates while preserving this source’s ability to capture current shifts in migration patterns.

Finally, the estimates of internal migration discussed here may be compared with data from census and census coverage studies (Reverse Record Check). Table 10 presents net interprovincial/territorial migration from these sources from the 1996 to 2001 period. Notwithstanding annual discrepancies between tax-returns-based and CTB-based estimates of migration, it seems that their 5-year period data are very comparable to each other and to the census and Reverse Record Check numbers.

Table 10. The net interprovincial migration based on different sources by province and territory, 1996 to 2001

Province/territory	Tax		CTB based	2001 Census	2001 RRC	Method 3
	old method	new method				
(1)	(2)	(3)	(4)	(5)	(6)	(7)
N.L.	-32,075	-37,577	-32,395	-31,035	-38,157	-29,350
P.E.I.	182	-504	309	140	-4,439	290
N.S.	-6,363	-5,832	-5,083	-1,290	5,037	-4,593
N.B.	-8,412	-11,593	-5,455	-8,430	-17,268	-4,916
Que.	-69,047	-69,128	-77,886	-57,310	-48,685	-70,908
Ont.	68,906	70,939	56,499	51,885	62,559	52,381
Man.	-21,041	-23,892	-14,880	-18,585	-25,418	-13,488
Sask.	-25,424	-28,553	-24,264	-24,925	-32,017	-22,304
Alta.	137,693	139,858	140,106	119,425	134,935	127,934
B.C.	-37,529	-27,656	-30,888	-23,620	-36,547	-29,507
Y.T.	-3,088	-2,770	-3,821	-2,755	..	-3,525
N.W.T.	-3,378	-3,020	..	-3,170	..	-2,016
Nvt. ¹	-424	-272	..	-330
average	31,812	32,430	35,599	26,377	40,506	30,101
sd	51,747	52,536	56,366	43,605	57,055	49,186

Notes:

The average is calculated using the absolute values of the net migration.

.. not available for specific reference period

1. For the CTB-based and Method 3, estimates for Nunavut are included with the Northwest Territories.

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Appendix A. Deriving modified out- and in-migration and migration flow matrix

Let F_i and P_i represent the respective annual final and preliminary out-migration originated in province or territory i (note also $\sum F_i = F$, and $\sum P_i = P$, where F and P represent total number of out-migrations of F and P estimates for any particular year). Then a simple regression model can be established as follows:

$$F_i = \alpha + \beta \times P_i + e_i \quad (\text{A1})$$

where α and β are parameters to be estimated, and e_i indicates the presence of error. It must be noted that our main concern is with statistical relationship or statistical explanation, not with any causal process involved in these two estimates. Fitting Eq. (A1) to every observed annual out-migration data, from 1993/94 to 2000/01 would provide the basic parameters for subsequent estimation.

The second step concerns the derivation of the preliminary modified estimates of out-migrants. Let PM_i represent the PM estimates of out-migrations for province or territory i . The following relation can be written for annual preliminary modified estimates of out-migrations,

$$PM_i = \alpha + \hat{\beta} \times P_i \quad (\text{A2})$$

It should be noted that the parameters in Eq. (A2) are obtained using the regression equation as shown in Eq. (A1). That is, the annual final is regressed on the annual preliminary estimates. This regression procedure has the following features:

- (1) there is an assumption of a one-year lag between the data used for fitting the regression and the reference period of estimating the PM version of out-migration;
- (2) the previous three-year data on both P and F are pooled; and
- (3) the regression is forced to be with zero-constant.

Suppose we would like to estimate PM out-migration for 1995/96, given the data on P of the same year. The previous three-year (i.e., 1994/95, 1993/94 and 1992/93) data on P and on F estimates are pooled to increase the number of observations and use Eq. (A1) to obtain the annual regression parameters. These annual regression parameters are used to obtain the PM estimates of out-migrations for 1995/96.

The regression procedure is based on three considerations. (1) There is an approximate one-year lag between P and F estimates of migration. In other words, the availability of F estimates of internal migration lags behind P estimates by one year. (2) We would like to have a reasonable number of observations for the regression. (3) The zero-constant approach can avoid the PM with negative numbers. For estimating PM in-migration, follow the same procedure and fit Eq. (A2) to the observed annual in-migration data to obtain the regression parameters, and use the parameters to obtain modified in-migration estimates.

For deriving the origin-destination migration matrix, we use a one-year lagged migration matrix of F estimates to redistribute PM out-migration. This derived migration matrix is evaluated against the matrix of F estimates using the percentage of migrants misallocated ($PMIS$). An origin or out-migration-constrained model is used for deriving the flow matrix using PM out-migration and, this model can be specified as

$$PM_{ij} = A_i \times PMO_i \times F_{ij} \quad (A3)$$

subject to constraint

$$\sum_{j \neq i} PM_{ij} = PMO_i \quad (A4)$$

where

$$A_i = \left[\sum_{j \neq i} F_{ij} \right]^{-1} \quad (A5)$$

where PM_{ij} is the redistributed or PM migration from province i to province j , PMO_i is the total PM estimates of outmigrants from province i , and F_{ij} is the one-year previous migration matrix of the F estimates. Notice that Eq. (A4) ensures that the total number of outmigrants from the redistributed matrix will match the observed number of outmigrants of the PM estimates, and Eq. (A5) ensures that this condition be satisfied (A_i is called the origin balancing factor).

Based on Eqs. (A3) – (A5), the redistribution procedure for PM estimates of out-migration using a one-year lagged matrix can be expressed by the following statement:

$$\begin{aligned} &\text{Preliminary modified estimates of matrix in year } t = \\ &\text{annual } PM \text{ out-migration in year } t \times \text{lagged annual matrix of} \\ &\text{the } F \text{ estimates in year } t-1 \times \text{the balancing factor } A_i \end{aligned} \quad (A6)$$

Following the convention, the redistribution procedure employs a goodness-of-fit statistic, the percentage of migrants misallocated ($PMIS$), to evaluate the redistributed or preliminary modified migration matrix against the matrix of the F estimates. The $PMIS$ between PM and the F estimates of migration matrices can be calculated using the following equation:

$$PMIS = \frac{50}{F} \sum_{i,j} |PM_{ij} - F_{ij}|, \quad (A7)$$

Where $PMIS$ represents the percentage of migrants misallocated in the migration matrix, F is total number of migrants of final estimates, and $|PM_{ij} - F_{ij}|$ is the absolute difference between the preliminary modified estimates of migrants and the F estimates of migrants. Any calculated value for this measure indicates the percentage of migrants that would have to be displaced to other provinces or territories in order for PM migration matrix to match the matrix of the F estimates. In other words,

PMIS indicates what percentage of migrants would have to be “displaced” to other provinces and territories in order for the modified origin-destination matrix to match the flow matrix of *F* estimates. The *PMIS* for *P* and for preliminary modified estimates can be compared to identify whether the preliminary modified estimates of migration matrix are close to the *F* estimates.

Suppose further we would like to derive the origin-destination flow matrix using both modified out- and modified in-migration. How can such a matrix be derived? Given the vectors of *PM* out- and *PM* in-migration as discussed above, we use an origin-destination migration (or out-migration-in-migration) constrained model to derive the flow matrix. In theory, such a model can be derived by analogue with statistical mechanics as in Wilson (1971). Past application of the model to Canadian data can be found, for example, in Pooler (1987). The model is used for redistributing *PMO* and *PMI*, and can be specified as

$$PM_{ij} = A_i \times PMO_i \times B_j \times PMI_j \times F_{ij} \quad (A8)$$

subject to constraints $\sum_{j=1}^n PM_{ij} = PMO_i (j \neq i)$ (A9)

$$\sum_{i=1}^n PM_{ij} = PMI_j (j \neq i) \quad (A10)$$

where $A_i = \left[\sum_{j=1}^n B_j \times PMI_j \times F_{ij} \right]^{-1}$ (A11)

$$B_j = \left[\sum_{i=1}^n A_i \times PMO_i \times F_{ij} \right]^{-1} \quad (A12)$$

where PMI_j is the total preliminary modified in-migration to province *j*, and all other terms are defined above. Notice that Eqs. (A9) and (A10) ensure that the total number of out-migration and in-migration from the redistributed flow matrix will match the observed number of *PMO* and *PMI* migration. Eqs. (A11) and (A12) ensure that these two conditions be satisfied (A_i is called the origin balancing factor and B_j destination balancing factor).

Based on Eqs. (A8) – (A12), the procedure for redistributing preliminary modified estimates of out-migration and in-migration using a one-year previous final matrix may be expressed by the following statement:

$$\begin{aligned} & \text{Preliminary modified estimates of flow matrix in year } t = \\ & \text{PMO in year } t \times \text{PMI in year } t \times \text{matrix of the final} \\ & \text{data in year } t-1 \times \text{the balancing factor } A_i \times \\ & \text{the balancing factor } B_j. \end{aligned} \tag{A13}$$

The goodness-of-fit statistic, the percentage of migrants misallocated (*PMIS*), introduced in Eq. (A7) is still used for the evaluation of the newly derived flow matrix.

Appendix B. Using the EWMA model to obtain *PMN* migration

In this method, we have employed the EWMA model (Pindyck and Rubinfeld, 1981) and only *F* estimates of net migration to derive *PMN* migration. The model is applied to the data for all the provinces and territories. The net migration data of *F* estimates have the following format.

Province	<i>t-2</i>	<i>t-1</i>	<i>t</i>	<i>t+1</i>
1	$F(t-2)_1$	$F(t-1)_1$	$F(t)_1$	$F(t+1)_1$
:	:	:	:	:
12	$F(t-1)_{12}$	$F(t-1)_{12}$	$F(t)_{12}$	$F(t+1)_{12}$

For each province or territory, we use *F* estimates of net migration from the previous three years and the following EWMA model:

$$F(t+1) = \alpha F(t) + \alpha(1-\alpha) F(t-1) + \alpha(1-\alpha)^2 F(t-2)$$

Here the parameter “ α ” is the number between 0 and 1 that indicates how heavily recent values are weighted relative to earlier ones. For example, when $\alpha = 1$, the above equation becomes $F(t+1) = F(t)$, and we ignore any values of *F* that occurred prior to “*t*”. As “ α ” becomes bigger, we place greater emphasis on recent values of *F*.

Appendix C. Net migration estimates using the first difference regression method ²

In a previous report, we summarized the results of employing five methods to estimate net migration. Overall, net migration estimates are not satisfactory although out- and in- migration estimates are considerably improved (He and Michalowski, 2003b). This note is to propose another method to estimate net migration. The proposed method is based on regressing the first difference of final net migration against that of preliminary net migration. In other words, the difference of final net between year t and year $t-1$ is regressed against the difference of preliminary net between year t and year $t-1$. We may call this the first difference regression method. In the following, we first outline the procedure of the method, and then provide the results of estimates.

Let FN_t^i and PN_t^i represent, respectively, the final and preliminary estimate of net migration for province/territory i (i is from 1 to 12) in year t . The first difference of final net and preliminary net can be written as follows:

$$\Delta FN_t^i = FN_t^i - FN_{t-1}^i \quad (C1)$$

$$\Delta PN_t^i = PN_t^i - PN_{t-1}^i \quad (C2)$$

The regression equation can be in the form of

$$\Delta FN = \beta \Delta PN + \varepsilon \quad (C3)$$

In our estimation, Equation (C3) is applied to a two-year difference of FN and PN , which virtually requires three-year data on the final net and preliminary net. The general relation between the expected difference of the final net and the difference of preliminary net can be written as

$$\Delta FN_E = \hat{\beta} \Delta PN \quad (C4)$$

Or in the form of Equation (C5)

$$\Delta FN_{E,t+1} = \hat{\beta} \Delta PN_{t+1} = \hat{\beta} (PN_{t+1} - PN_t) \quad (C5)$$

and eventually, the expected final net can be derived from the form of equation (C6)

$$FN_{E,t+1}^i = FN_t^i + \Delta FN_{E,t+1}^i \quad (C6)$$

The actual estimates using the above regression method (suppose that we would like to derive the final net for the year 1994/95) have the following steps:

2. This method was suggested by Réjean Lachapelle, director of Demography Division.

- (1) Calculate ΔFN_t^i and ΔPN_t^i for two years to have 24 observations. Specifically,

$$\Delta FN_{93/94}^i = FN_{93/94}^i - FN_{92/93}^i$$

$$\Delta FN_{92/93}^i = FN_{92/93}^i - FN_{91/92}^i$$

- (2) Run the regression to have the regression parameter.
 (3) Obtain the expected difference of FN .

$$\Delta FN_{E,94/95}^i = b\Delta PN_{94/95}^i$$

- (4) Obtain the expected FN .

$$FN_{E,94/95}^i = FN_{93/94}^i + \Delta FN_{E,94/95}^i$$

In the meantime, outliers, defined as residuals for observations exceeding two standard deviations, were removed from the regression equation. In other words, outliers are the observations with standardised residuals greater than two (Draper and Smith, 1981). As a result, we have run two regressions. One is based on 24 observations (regression 1) and the other based on observations after removing the outliers (regression 2). No further regression is estimated even though there may still be outlier(s) in some cases after regression 2.

Appendix D. Statistical tables

Table D1: Comparison of annual Preliminary (P), Final (F) estimates of out-, in-, and net- migration, 1993/94 to 2000/01

Newfoundland and Labrador					
	Year	P	F	D=P-F	PD=(4)/(3)*100
	(1)	(2)	(3)	(4)	(5)
Out-migration	1993/94	15,037	11,532	3,505	30.39
	1994/95	18,867	13,380	5,487	41.01
	1995/96	18,238	14,441	3,797	26.29
	1996/97	20,196	15,096	5,100	33.78
	1997/98	21,251	16,882	4,369	25.88
	1998/99	16,613	13,690	2,923	21.35
	1999/2000	14,119	12,663	1,456	11.50
	2000/01	14,152	11,992	2,160	18.01
	Average	17,309	13,710	3,600	26.03
	sd	2,750	1,749	1,393	9.27
In-migration	1993/94	10,529	6,580	3,949	60.02
	1994/95	10,457	6,406	4,051	63.24
	1995/96	10,665	7,005	3,660	52.25
	1996/97	10,911	6,962	3,949	56.72
	1997/98	9,817	7,392	2,425	32.81
	1998/99	10,988	7,995	2,993	37.44
	1999/2000	11,609	8,400	3,209	38.20
	2000/01	10,611	7,499	3,112	41.50
	Average	10,698	7,280	3,419	47.77
	sd	511	682	577	11.66
Net-migration	1993/94	-4,508	-4,952	444	-8.97
	1994/95	-8,410	-6,974	-1,436	20.59
	1995/96	-7,573	-7,436	-137	1.84
	1996/97	-9,285	-8,134	-1,151	14.15
	1997/98	-11,434	-9,490	-1,944	20.48
	1998/99	-5,625	-5,695	70	-1.23
	1999/2000	-2,510	-4,263	1,753	-41.12
	2000/01	-3,541	-4,493	952	-21.19
	Average	-6,611	-6,430	-181	-1.93
	sd	3,076	1,880	1,259	21.51

Table D1 (cont.)

Prince Edward Island					
Island	Year	P	F	D=P-F	PD=(4)/(3)*100
Out-migration	(1)	(2)	(3)	(4)	(5)
	1993/94	2,337	2,066	271	13.12
	1994/95	2,623	2,165	458	21.15
	1995/96	2,602	2,244	358	15.95
	1996/97	3,333	2,558	775	30.30
	1997/98	3,679	2,986	693	23.21
	1998/99	2,816	2,386	430	18.02
	1999/2000	2,382	2,558	-176	-6.88
	2000/01	2,816	2,402	414	17.24
	Average	2,824	2,421	403	16.51
sd	465	288	288	10.81	
In-migration	1993/94	2,973	2,688	285	10.60
	1994/95	3,498	2,514	984	39.14
	1995/96	3,482	2,882	600	20.82
	1996/97	3,277	2,694	583	21.64
	1997/98	2,828	2,570	258	10.04
	1998/99	2,982	2,579	403	15.63
	1999/2000	3,361	2,662	699	26.26
	2000/01	2,887	2,567	320	12.47
	Average	3,161	2,645	517	19.57
	sd	273	116	249	9.79
Net-migration	1993/94	636	622	14	2.25
	1994/95	875	349	526	150.72
	1995/96	880	638	242	37.93
	1996/97	-56	136	-192	-141.18
	1997/98	-851	-416	-435	104.57
	1998/99	166	193	-27	-13.99
	1999/2000	979	104	875	841.35
	2000/01	71	165	-94	-56.97
	Average	338	224	114	115.58
	sd	627	334	420	306.93

Table D1 (cont.)

Nova Scotia	Year	P	F	D=P-F	PD=(4)/(3)*100
	(1)	(2)	(3)	(4)	(5)
Out-migration					
	1993/94	20,245	17,146	3,099	18.07
	1994/95	22,700	18,040	4,660	25.83
	1995/96	21,194	17,508	3,686	21.05
	1996/97	19,846	17,526	2,320	13.24
	1997/98	23,055	18,873	4,182	22.16
	1998/99	16,776	15,328	1,448	9.45
	1999/2000	17,985	16,542	1,443	8.72
	2000/01	19,156	17,390	1,766	10.16
	Average	20,120	17,294	2,826	16.09
	sd	2,177	1,043	1,265	6.57
In-migration					
	1993/94	19,422	15,259	4,163	27.28
	1994/95	19,883	15,299	4,584	29.96
	1995/96	20,301	16,263	4,038	24.83
	1996/97	19,703	15,878	3,825	24.09
	1997/98	18,015	16,304	1,711	10.49
	1998/99	17,035	15,529	1,506	9.70
	1999/2000	18,650	16,272	2,378	14.61
	2000/01	18,332	15,313	3,019	19.72
	Average	18,918	15,765	3,153	20.09
	sd	1,101	469	1,178	7.73
Net-migration					
	1993/94	-823	-1,887	1,064	-56.39
	1994/95	-2,817	-2,741	-76	2.77
	1995/96	-893	-1,245	352	-28.27
	1996/97	-143	-1,648	1,505	-91.32
	1997/98	-5,040	-2,569	-2,471	96.19
	1998/99	259	201	58	28.86
	1999/2000	665	-270	935	-346.30
	2000/01	-824	-2,077	1,253	-60.33
	Average	-1,202	-1,530	328	-56.85
	sd	1,869	1,046	1,266	130.99

Table D1 (cont.)

New Brunswick	Year	P	F	D=P-F	PD=(4)/(3)*100
	(1)	(2)	(3)	(4)	(5)
Out-migration	1993/94	14,965	11,396	3,569	31.32
	1994/95	16,130	11,666	4,464	38.27
	1995/96	14,835	12,139	2,696	22.21
	1996/97	15,637	12,493	3,144	25.17
	1997/98	17,259	14,096	3,163	22.44
	1998/99	13,637	11,714	1,923	16.42
	1999/2000	13,585	12,469	1,116	8.95
	2000/01	13,797	12,069	1,728	14.32
	Average	14,981	12,255	2,725	22.39
	sd	1,316	838	1,091	9.42
In-migration	1993/94	15,189	10,725	4,464	41.62
	1994/95	15,297	10,853	4,444	40.95
	1995/96	14,607	11,770	2,837	24.10
	1996/97	13,726	11,230	2,496	22.23
	1997/98	14,203	10,904	3,299	30.25
	1998/99	12,706	10,470	2,236	21.36
	1999/2000	14,109	11,286	2,823	25.01
	2000/01	13,716	10,539	3,177	30.15
	Average	14,194	10,972	3,222	29.46
	sd	849	434	832	8.00
Net-migration	1993/94	224	-671	895	-133.38
	1994/95	-833	-813	-20	2.46
	1995/96	-228	-369	141	-38.21
	1996/97	-1,911	-1,263	-648	51.31
	1997/98	-3,056	-3,192	136	-4.26
	1998/99	-931	-1,244	313	-25.16
	1999/2000	524	-1,183	1,707	-144.29
	2000/01	-81	-1,530	1,449	-94.71
	Average	-787	-1,283	497	-48.28
	sd	1,194	858	793	69.37

Table D1 (cont.)

Quebec	Year	P	F	D=P-F	PD=(4)/(3)*100
	(1)	(2)	(3)	(4)	(5)
Out-migration	1993/94	43,884	32,535	11,349	34.88
	1994/95	43,042	32,003	11,039	34.49
	1995/96	41,307	35,182	6,125	17.41
	1996/97	44,334	37,873	6,461	17.06
	1997/98	43,627	37,471	6,156	16.43
	1998/99	39,908	32,571	7,337	22.53
	1999/2000	41,376	33,135	8,241	24.87
	2000/01	36,616	30,783	5,833	18.95
	Average	41,762	33,944	7,818	23.33
	sd	2,578	2,610	2,225	7.58
	In-migration	1993/94	31,356	23,777	7,579
1994/95		27,758	23,056	4,702	20.39
1995/96		28,090	22,556	5,534	24.53
1996/97		27,709	20,437	7,272	35.58
1997/98		26,173	20,513	5,660	27.59
1998/99		24,226	19,506	4,720	24.20
1999/2000		25,033	20,989	4,044	19.27
2000/01		24,834	21,341	3,493	16.37
Average		26,897	21,522	5,376	24.98
sd		2,333	1,468	1,452	6.50
Net-migration		1993/94	-12,528	-8,758	-3,770
	1994/95	-15,284	-8,947	-6,337	70.83
	1995/96	-13,217	-12,626	-591	4.68
	1996/97	-16,625	-17,436	811	-4.65
	1997/98	-17,454	-16,958	-496	2.92
	1998/99	-15,682	-13,065	-2,617	20.03
	1999/2000	-16,343	-12,146	-4,197	34.55
	2000/01	-11,782	-9,442	-2,340	24.78
	Average	-14,864	-12,422	-2,442	24.52
	sd	2,088	3,394	2,325	24.84

Table D1 (cont.)

Ontario	Year	P	F	D=P-F	PD=(4)/(3)*100
	(1)	(2)	(3)	(4)	(5)
Out-migration	1993/94	99,174	74,045	25,129	33.94
	1994/95	85,609	69,743	15,866	22.75
	1995/96	89,969	71,881	18,088	25.16
	1996/97	86,704	68,001	18,703	27.50
	1997/98	79,018	65,985	13,033	19.75
	1998/99	65,903	56,115	9,788	17.44
	1999/2000	71,529	56,534	14,995	26.52
	2000/01	67,884	55,893	11,991	21.45
	Average	80,724	64,775	15,949	24.32
	sd	11,695	7,510	4,773	5.17
In-migration	1993/94	88,110	64,625	23,485	36.34
	1994/95	90,211	66,902	23,309	34.84
	1995/96	84,390	69,059	15,331	22.20
	1996/97	81,884	69,978	11,906	17.01
	1997/98	85,680	75,216	10,464	13.91
	1998/99	82,865	72,821	10,044	13.79
	1999/2000	91,347	78,903	12,444	15.77
	2000/01	85,761	74,516	11,245	15.09
	Average	86,281	71,503	14,779	21.12
	sd	3,374	4,723	5,556	9.32
Net-migration	1993/94	-11,064	-9,420	-1,644	17.45
	1994/95	4,602	-2,841	7,443	-261.99
	1995/96	-5,579	-2,822	-2,757	97.70
	1996/97	-4,820	1,977	-6,797	-343.80
	1997/98	6,662	9,231	-2,569	-27.83
	1998/99	16,962	16,706	256	1.53
	1999/2000	19,818	22,369	-2,551	-11.40
	2000/01	17,877	18,623	-746	-4.01
	Average	5,557	6,728	-1,171	-66.54
	sd	11,924	11,699	4,047	152.21

Table D1 (cont.)

Manitoba	Year	P	F	D=P-F	PD=(4)/(3)*100
	(1)	(2)	(3)	(4)	(5)
Out-migration					
	1993/94	25,997	19,867	6,130	30.86
	1994/95	25,448	19,110	6,338	33.17
	1995/96	22,757	18,641	4,116	22.08
	1996/97	21,727	19,756	1,971	9.98
	1997/98	23,073	20,182	2,891	14.32
	1998/99	19,762	16,098	3,664	22.76
	1999/2000	20,244	17,531	2,713	15.48
	2000/01	20,656	16,946	3,710	21.89
	Average	22,458	18,516	3,942	21.32
	sd	2,326	1,502	1,567	7.98
In-migration					
	1993/94	21,351	15,253	6,098	39.98
	1994/95	23,286	15,890	7,396	46.54
	1995/96	20,811	15,075	5,736	38.05
	1996/97	17,946	13,883	4,063	29.27
	1997/98	17,690	14,906	2,784	18.68
	1998/99	18,430	13,985	4,445	31.78
	1999/2000	18,954	14,075	4,879	34.66
	2000/01	17,562	12,623	4,939	39.13
	Average	19,504	14,461	5,043	34.76
	sd	2,083	1,023	1,393	8.40
Net-migration					
	1993/94	-4,646	-4,614	-32	0.69
	1994/95	-2,162	-3,220	1,058	-32.86
	1995/96	-1,946	-3,566	1,620	-45.43
	1996/97	-3,781	-5,873	2,092	-35.62
	1997/98	-5,383	-5,276	-107	2.03
	1998/99	-1,332	-2,113	781	-36.96
	1999/2000	-1,290	-3,456	2,166	-62.67
	2000/01	-3,094	-4,323	1,229	-28.43
	Average	-2,954	-4,055	1,101	-29.91
	sd	1,536	1,210	866	21.92

Table D1 (cont.)

Saskatchewan	Year	P	F	D=P-F	PD=(4)/(3)*100
	(1)	(2)	(3)	(4)	(5)
Out-migration					
	1993/94	27,500	22,259	5,241	23.55
	1994/95	27,689	20,466	7,223	35.29
	1995/96	24,219	19,572	4,647	23.74
	1996/97	23,360	19,565	3,795	19.40
	1997/98	24,571	20,637	3,934	19.06
	1998/99	25,093	19,533	5,560	28.46
	1999/2000	27,079	22,503	4,576	20.34
	2000/01	28,950	21,395	7,555	35.31
	Average	26,058	20,741	5,316	25.64
	sd	1,998	1,203	1,411	6.69
In-migration					
	1993/94	24,560	16,828	7,732	45.95
	1994/95	23,522	16,814	6,708	39.90
	1995/96	23,476	17,411	6,065	34.83
	1996/97	21,774	16,771	5,003	29.83
	1997/98	21,204	18,697	2,507	13.41
	1998/99	22,533	15,200	7,333	48.24
	1999/2000	20,781	14,556	6,225	42.77
	2000/01	18,497	12,985	5,512	42.45
	Average	22,043	16,158	5,886	37.17
	sd	1,918	1,806	1,633	11.28
Net-migration					
	1993/94	-2,940	-5,431	2,491	-45.87
	1994/95	-4,167	-3,652	-515	14.10
	1995/96	-743	-2,161	1,418	-65.62
	1996/97	-1,586	-2,794	1,208	-43.24
	1997/98	-3,367	-1,940	-1,427	73.56
	1998/99	-2,560	-4,333	1,773	-40.92
	1999/2000	-6,298	-7,947	1,649	-20.75
	2000/01	-10,453	-8,410	-2,043	24.29
	Average	-4,014	-4,584	569	-13.05
	sd	3,093	2,498	1,666	46.63

Table D1 (cont.)

Alberta	Year	P	F	D=P-F	PD=(4)/(3)*100
	(1)	(2)	(3)	(4)	(5)
Out-migration	1993/94	70,393	53,393	17,000	31.84
	1994/95	66,727	51,803	14,924	28.81
	1995/96	61,192	49,381	11,811	23.92
	1996/97	54,065	44,051	10,014	22.73
	1997/98	50,442	43,218	7,224	16.72
	1998/99	54,706	45,741	8,965	19.60
	1999/2000	60,892	48,047	12,845	26.73
	2000/01	53,623	43,672	9,951	22.79
	Average	59,005	47,413	11,592	24.14
	sd	6,998	3,873	3,232	4.89
In-migration	1993/94	65,668	51,763	13,905	26.86
	1994/95	62,649	51,247	11,402	22.25
	1995/96	66,931	57,037	9,894	17.35
	1996/97	78,779	70,333	8,446	12.01
	1997/98	97,229	86,307	10,922	12.65
	1998/99	85,770	70,932	14,838	20.92
	1999/2000	72,685	70,721	1,964	2.78
	2000/01	79,371	64,129	15,242	23.77
	Average	76,135	65,309	10,827	17.32
	sd	11,608	11,821	4,318	7.85
Net-migration	1993/94	-4,725	-1,630	-3,095	189.88
	1994/95	-4,078	-556	-3,522	633.45
	1995/96	5,739	7,656	-1,917	-25.04
	1996/97	24,714	26,282	-1,568	-5.97
	1997/98	46,787	43,089	3,698	8.58
	1998/99	31,064	25,191	5,873	23.31
	1999/2000	11,793	22,674	-10,881	-47.99
	2000/01	25,748	20,457	5,291	25.86
	Average	17,130	17,895	-765	100.26
	sd	18,092	15,186	5,580	227.14

Table D1 (cont.)

British Columbia		Year	P	F	D=P-F	PD=(4)/(3)*100
Out-migration	(1)	(2)	(3)	(4)	(5)	
	1993/94	53,767	38,678	15,089	39.01	
	1994/95	55,130	41,492	13,638	32.87	
	1995/96	57,681	44,934	12,747	28.37	
	1996/97	57,295	49,552	7,743	15.63	
	1997/98	65,602	61,553	4,049	6.58	
	1998/99	71,969	57,784	14,185	24.55	
	1999/2000	65,019	58,075	6,944	11.96	
	2000/01	62,708	51,624	11,084	21.47	
	Average	61,146	50,462	10,685	22.55	
	sd	6,233	8,338	3,990	10.90	
In-migration						
	1993/94	95,388	76,549	18,839	24.61	
	1994/95	87,542	70,783	16,759	23.68	
	1995/96	81,141	66,959	14,182	21.18	
	1996/97	71,582	59,432	12,150	20.44	
	1997/98	61,372	51,524	9,848	19.11	
	1998/99	50,866	43,300	7,566	17.47	
	1999/2000	57,866	43,465	14,401	33.13	
	2000/01	50,019	43,338	6,681	15.42	
	Average	69,472	56,919	12,553	21.88	
	sd	17,170	13,441	4,311	5.46	
Net-migration						
	1993/94	41,621	37,871	3,750	9.90	
	1994/95	32,412	29,291	3,121	10.66	
	1995/96	23,460	22,025	1,435	6.52	
	1996/97	14,287	9,880	4,407	44.61	
	1997/98	-4,230	-10,029	5,799	-57.82	
	1998/99	-21,103	-14,484	-6,619	45.70	
	1999/2000	-7,153	-14,610	7,457	-51.04	
	2000/01	-12,689	-8,286	-4,403	53.14	
	Average	8,326	6,457	1,868	7.71	
	sd	22,860	21,159	4,925	42.48	

Table D1 (cont.)

Yukon Territory	Year	P	F	D=P-F	PD=(4)/(3)*100
	(1)	(2)	(3)	(4)	(5)
Out-migration	1993/94	2,845	2,652	193	7.28
	1994/95	2,289	1,798	491	27.31
	1995/96	2,073	1,639	434	26.48
	1996/97	2,464	1,959	505	25.78
	1997/98	2,663	2,526	137	5.42
	1998/99	2,878	2,053	825	40.19
	1999/2000	2,321	1,958	363	18.54
	2000/01	2,311	1,725	586	33.97
	Average	2,481	2,039	442	23.12
	sd	288	367	219	12.13
In-migration	1993/94	1,969	1,558	411	26.38
	1994/95	2,383	2,067	316	15.29
	1995/96	2,874	2,203	671	30.46
	1996/97	2,332	1,905	427	22.41
	1997/98	1,734	1,502	232	15.45
	1998/99	1,606	1,306	300	22.97
	1999/2000	1,679	1,267	412	32.52
	2000/01	1,465	1,153	312	27.06
	Average	2,005	1,620	385	24.07
	sd	484	393	134	6.35
Net-migration	1993/94	-876	-1,094	218	-19.93
	1994/95	94	269	-175	-65.06
	1995/96	801	564	237	42.02
	1996/97	-132	-54	-78	144.44
	1997/98	-929	-1,024	95	-9.28
	1998/99	-1,272	-747	-525	70.28
	1999/2000	-642	-691	49	-7.09
	2000/01	-846	-572	-274	47.90
	Average	-475	-419	-57	25.41
	sd	680	609	261	64.88

Table D1 (concl.)

Northwest Territories					
Territories	Year	P	F	D=P-F	PD=(4)/(3)*100
Out-migration	(1)	(2)	(3)	(4)	(5)
	1993/94	4,444	3,339	1,105	33.09
	1994/95	4,373	3,302	1,071	32.43
	1995/96	4,551	3,723	828	22.24
	1996/97	4,188	3,917	271	6.92
	1997/98	4,590	4,249	341	8.03
	1998/99	3,347	3,459	-112	-3.24
	1999/2000	2,965	3,399	-434	-12.77
	2000/01	3,907	2,958	949	32.08
	Average	4,046	3,543	502	14.85
	sd	599	404	576	17.70
In-migration					
	1993/94	4,073	3,303	770	23.31
	1994/95	4,141	3,137	1,004	32.01
	1995/96	3,850	3,065	785	25.61
	1996/97	3,526	2,844	682	23.98
	1997/98	2,885	2,823	62	2.20
	1998/99	3,401	2,849	552	19.38
	1999/2000	3,422	2,818	604	21.43
	2000/01	3,521	2,846	675	23.72
	Average	3,602	2,961	642	21.45
	sd	409	184	272	8.61
Net-migration					
	1993/94	-371	-36	-335	930.56
	1994/95	-232	-165	-67	40.61
	1995/96	-701	-658	-43	6.53
	1996/97	-662	-1,073	411	-38.30
	1997/98	-1,705	-1,426	-279	19.57
	1998/99	54	-610	664	-108.85
	1999/2000	457	-581	1,038	-178.66
	2000/01	-386	-112	-274	244.64
	Average	-443	-583	139	114.51
	sd	634	486	508	352.17

Table D2: Preliminary estimates of interprovincial migration matrix, 1993/94 to 2000/01

1993/94	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	241	2,326	729	337	7,329	267	157	1,513	1,800	46	292
P.E.I.	102	0	422	514	67	728	44	50	201	197	0	12
N.S.	1,809	696	0	2,896	1,186	7,442	585	269	1,995	3,112	30	225
N.B.	501	424	2,849	0	2,409	5,472	366	121	1,326	1,267	13	217
Que.	349	157	1,233	2,557	0	29,359	639	377	2,296	6,671	108	138
Ont.	5,623	985	8,149	5,802	21,340	0	6,807	3,021	15,052	31,487	293	615
Man.	156	50	463	381	777	7,338	0	3,592	5,608	7,209	56	367
Sask.	87	34	291	140	333	2,506	3,441	0	13,446	6,828	63	331
Alta.	1,052	226	1,662	1,082	1,868	11,816	4,618	12,040	0	34,411	436	1,182
B.C.	623	133	1,902	966	2,884	15,642	4,147	4,357	21,755	0	785	573
Y.T.	28	0	11	24	39	101	85	176	660	1,600	0	121
N.W.T.	199	27	114	98	116	377	352	400	1,816	806	139	0
IN	10,529	2,973	19,422	15,189	31,356	88,110	21,351	24,560	65,668	95,388	1,969	4,073
OUT	15,037	2,337	20,245	14,965	43,884	99,174	25,997	27,500	70,393	53,767	2,845	4,444
NET	-4,508	636	-823	224	-12,528	-11,064	-4,646	-2,940	-4,725	41,621	-876	-371

1994/95	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	208	2,710	815	382	9,140	314	116	2,447	2,204	61	470
P.E.I.	157	0	624	435	65	757	43	33	207	298	4	0
N.S.	1,804	955	0	3,441	1,105	8,208	555	396	2,295	3,688	56	197
N.B.	545	719	3,191	0	2,618	5,580	396	157	1,546	1,306	0	72
Que.	351	92	1,098	3,035	0	28,143	719	346	1,954	7,101	28	175
Ont.	5,379	986	7,404	4,891	18,017	0	7,204	2,490	12,113	26,425	194	506
Man.	197	45	510	429	699	7,180	0	4,020	5,112	6,871	46	339
Sask.	87	64	270	215	279	3,219	4,249	0	12,971	5,923	86	326
Alta.	1,027	163	1,910	1,065	1,655	11,412	5,025	10,793	0	31,649	633	1,395
B.C.	750	262	1,973	861	2,745	15,846	4,368	4,874	21,828	0	1,124	499
Y.T.	0	4	9	16	39	133	17	41	560	1,308	0	162
N.W.T.	160	0	184	94	154	593	396	256	1,616	769	151	0
IN	10,457	3,498	19,883	15,297	27,758	90,211	23,286	23,522	62,649	87,542	2,383	4,141
OUT	18,867	2,623	22,700	16,130	43,042	85,609	25,448	27,689	66,727	55,130	2,289	4,373
NET	-8,410	875	-2,817	-833	-15,284	4,602	-2,162	-4,167	-4,078	32,412	94	-232

1995/96	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	305	2,629	848	351	7,890	434	111	2,747	2,350	170	403
P.E.I.	230	0	470	560	43	773	60	38	179	240	0	9
N.S.	1,577	830	0	2,897	946	7,976	590	300	2,773	3,080	41	184
N.B.	687	540	2,683	0	2,444	4,874	332	216	1,494	1,433	22	110
Que.	287	99	1,137	2,593	0	27,522	708	438	2,131	6,157	61	174
Ont.	5,360	1,077	8,115	4,960	19,153	0	6,348	2,581	13,668	28,093	233	381
Man.	97	117	442	323	528	6,346	0	3,216	5,636	5,602	104	346
Sask.	63	33	337	138	387	2,498	3,522	0	11,625	5,243	153	220
Alta.	1,222	288	1,912	1,245	1,564	10,368	4,071	11,027	0	27,322	723	1,450
B.C.	930	155	2,450	911	2,482	15,418	4,256	4,974	24,326	0	1,260	519
Y.T.	13	9	32	16	27	214	67	75	542	1,024	0	54
N.W.T.	199	29	94	116	165	511	423	500	1,810	597	107	0
IN	10,665	3,482	20,301	14,607	28,090	84,390	20,811	23,476	66,931	81,141	2,874	3,850
OUT	18,238	2,602	21,194	14,835	41,307	89,969	22,757	24,219	61,192	57,681	2,073	4,551
NET	-7,573	880	-893	-228	-13,217	-5,579	-1,946	-743	5,739	23,460	801	-701

Research on modifications to the method of preliminary estimates of interprovincial migration

Table D2 (cont.)

1996/97	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	185	2,372	751	400	7,889	348	222	5,429	2,011	124	465
P.E.I.	364	0	923	496	80	931	83	9	242	184	21	0
N.S.	1,462	955	0	2,999	1,069	6,530	574	229	3,043	2,697	125	163
N.B.	778	679	2,972	0	2,518	4,741	301	223	1,912	1,353	25	135
Que.	262	73	1,190	2,841	0	28,457	763	446	4,056	5,979	57	210
Ont.	5,419	828	7,191	4,504	18,533	0	5,881	2,524	16,278	24,976	190	380
Man.	204	43	492	216	428	5,674	0	3,587	5,949	4,778	64	292
Sask.	95	31	373	137	240	2,502	3,032	0	12,611	4,025	73	241
Alta.	1,198	226	1,529	843	1,348	10,420	3,503	9,774	0	23,816	375	1,033
B.C.	897	227	2,427	884	2,908	14,134	3,083	4,278	26,949	0	1,001	507
Y.T.	43	12	60	11	27	140	42	151	747	1,131	0	100
N.W.T.	189	18	174	44	158	466	336	331	1,563	632	277	0
IN	10,911	3,277	19,703	13,726	27,709	81,884	17,946	21,774	78,779	71,582	2,332	3,526
OUT	20,196	3,333	19,846	15,637	44,334	86,704	21,727	23,360	54,065	57,295	2,464	4,188
NET	-9,285	-56	-143	-1,911	-16,625	-4,820	-3,781	-1,586	24,714	14,287	-132	-662

1997/98	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	293	2,240	948	410	7,491	294	413	7,272	1,436	88	366
P.E.I.	93	0	762	565	189	913	103	59	740	255	0	0
N.S.	1,634	610	0	2,925	993	8,417	525	425	4,762	2,604	60	100
N.B.	662	369	3,052	0	2,375	5,270	310	309	3,457	1,394	0	61
Que.	282	110	1,132	2,741	0	28,446	654	330	4,455	5,246	33	198
Ont.	4,026	885	6,235	4,254	17,160	0	5,648	2,194	17,172	20,821	145	478
Man.	151	70	540	316	475	5,908	0	3,679	7,046	4,597	86	205
Sask.	152	21	142	132	256	2,342	2,795	0	14,458	3,935	75	263
Alta.	1,574	287	1,912	1,268	1,245	10,508	3,410	9,518	0	19,448	414	858
B.C.	921	163	1,710	958	2,905	15,708	3,632	3,762	34,769	0	766	308
Y.T.	113	0	19	7	47	177	53	166	989	1,044	0	48
N.W.T.	209	20	271	89	118	500	266	349	2,109	592	67	0
IN	9,817	2,828	18,015	14,203	26,173	85,680	17,690	21,204	97,229	61,372	1,734	2,885
OUT	21,251	3,679	23,055	17,259	43,627	79,018	23,073	24,571	50,442	65,602	2,663	4,590
NET	-11,434	-851	-5,040	-3,056	-17,454	6,662	-5,383	-3,367	46,787	-4,230	-929	-1,705

1998/99	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	463	2,115	897	282	6,793	284	253	4,416	759	19	332
P.E.I.	134	0	744	523	131	657	14	64	301	243	5	0
N.S.	1,344	554	0	2,699	796	5,682	539	213	3,076	1,645	64	164
N.B.	494	445	2,988	0	2,051	4,280	244	171	1,969	706	123	166
Que.	266	238	851	2,104	0	27,896	513	338	3,750	3,764	46	142
Ont.	4,276	656	5,387	3,773	15,004	0	5,258	2,493	13,134	15,260	156	506
Man.	227	48	377	159	338	5,576	0	4,205	5,247	3,360	33	192
Sask.	220	38	203	126	310	2,630	3,707	0	13,747	3,694	82	336
Alta.	2,786	287	2,348	1,482	1,695	11,053	3,684	10,204	0	19,851	227	1,089
B.C.	967	231	1,932	883	3,474	17,634	3,936	4,314	37,503	0	713	382
Y.T.	84	22	47	10	31	263	73	70	1,021	1,165	0	92
N.W.T.	190	0	43	50	114	401	178	208	1,606	419	138	0
IN	10,988	2,982	17,035	12,706	24,226	82,865	18,430	22,533	85,770	50,866	1,606	3,401
OUT	16,613	2,816	16,776	13,637	39,908	65,903	19,762	25,093	54,706	71,969	2,878	3,347
NET	-5,625	166	259	-931	-15,682	16,962	-1,332	-2,560	31,064	-21,103	-1,272	54

Research on modifications to the method of preliminary estimates of interprovincial migration

Table D2 (concl.)

1999/2000	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	430	2,198	809	138	6,492	187	120	2,769	619	56	301
P.E.I.	167	0	610	501	45	652	10	22	182	174	9	10
N.S.	1,520	694	0	3,232	772	6,902	444	251	2,331	1,612	30	197
N.B.	546	658	3,091	0	2,255	4,137	239	127	1,511	892	42	87
Que.	362	123	1,073	2,184	0	30,300	704	269	2,524	3,642	42	153
Ont.	4,672	841	6,106	4,528	16,215	0	5,459	2,434	11,208	19,211	201	654
Man.	191	41	517	246	568	6,135	0	3,491	5,044	3,898	25	88
Sask.	167	42	436	108	174	3,413	3,871	0	14,475	4,134	58	201
Alta.	2,763	264	2,694	1,673	1,992	13,196	4,214	10,236	0	22,331	374	1,155
B.C.	1,066	264	1,755	766	2,759	19,437	3,542	3,576	30,707	0	738	409
Y.T.	26	4	35	0	29	234	92	81	688	965	0	167
N.W.T.	129	0	135	62	86	449	192	174	1,246	388	104	0
IN	11,609	3,361	18,650	14,109	25,033	91,347	18,954	20,781	72,685	57,866	1,679	3,422
OUT	14,119	2,382	17,985	13,585	41,376	71,529	20,244	27,079	60,892	65,019	2,321	2,965
NET	-2,510	979	665	524	-16,343	19,818	-1,290	-6,298	11,793	-7,153	-642	457

2000/01	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	299	1,947	949	203	6,112	152	176	3,513	565	15	221
P.E.I.	201	0	747	353	176	654	20	11	295	277	9	73
N.S.	1,543	631	0	3,247	1,117	7,406	332	343	2,766	1,512	42	217
N.B.	546	482	3,057	0	2,028	4,559	264	113	1,835	744	85	84
Que.	206	142	870	2,444	0	26,384	495	315	2,735	2,689	52	284
Ont.	4,620	842	6,876	3,917	15,968	0	5,322	1,696	12,639	15,173	127	704
Man.	186	29	389	308	457	6,169	0	3,409	5,724	3,718	31	236
Sask.	149	29	369	91	295	2,964	4,015	0	16,828	3,982	89	139
Alta.	2,153	248	2,057	1,514	1,858	11,869	3,752	9,000	0	19,847	292	1,033
B.C.	714	157	1,932	818	2,576	18,868	2,890	3,127	30,627	0	625	374
Y.T.	22	7	17	9	8	122	40	58	861	1,011	0	156
N.W.T.	271	21	71	66	148	654	280	249	1,548	501	98	0
IN	10,611	2,887	18,332	13,716	24,834	85,761	17,562	18,497	79,371	50,019	1,465	3,521
OUT	14,152	2,816	19,156	13,797	36,616	67,884	20,656	28,950	53,623	62,708	2,311	3,907
NET	-3,541	71	-824	-81	-11,782	17,877	-3,094	-10,453	25,748	-12,689	-846	-386

Table D3: Final estimates of interprovincial migration matrix, 1993/94 to 2000/01

1993/94	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	214	1,977	596	323	4,859	197	100	1,340	1,611	41	274
P.E.I.	93	0	490	332	92	579	22	45	188	221	1	3
N.S.	1,168	638	0	2,439	942	6,268	485	232	1,734	3,020	25	195
N.B.	369	408	2,391	0	1,893	3,599	286	136	1,106	1,115	10	83
Que.	313	131	994	1,914	0	21,035	522	258	1,897	5,297	51	123
Ont.	3,096	877	5,746	3,475	15,826	0	4,618	2,384	11,928	25,343	164	588
Man.	159	36	424	341	579	4,944	0	2,583	4,612	5,910	51	228
Sask.	87	47	261	101	336	2,151	2,556	0	10,900	5,455	93	272
Alta.	722	175	1,325	743	1,529	9,706	3,474	7,772	0	26,524	353	1,070
B.C.	407	139	1,469	666	2,047	10,886	2,769	2,956	16,303	0	658	378
Y.T.	61	5	47	22	28	158	77	119	610	1,436	0	89
N.W.T.	105	18	135	96	182	440	247	243	1,145	617	111	0
IN	6,580	2,688	15,259	10,725	23,777	64,625	15,253	16,828	51,763	76,549	1,558	3,303
OUT	11,532	2,066	17,146	11,396	32,535	74,045	19,867	22,259	53,393	38,678	2,652	3,339
NET	-4,952	622	-1,887	-671	-8,758	-9,420	-4,614	-5,431	-1,630	37,871	-1,094	-36

1994/95	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	217	1,879	628	246	5,745	273	99	1,968	1,984	59	282
P.E.I.	80	0	517	353	66	627	36	34	228	207	3	14
N.S.	1,259	643	0	2,512	984	6,445	560	280	2,175	2,965	56	161
N.B.	381	391	2,284	0	2,007	3,674	322	141	1,191	1,173	18	84
Que.	305	101	1,007	1,878	0	20,663	605	312	1,788	5,168	39	137
Ont.	2,880	766	5,756	3,494	15,036	0	4,702	1,958	10,952	23,530	217	452
Man.	120	25	456	283	581	4,980	0	2,483	4,757	5,191	41	193
Sask.	82	50	246	162	282	2,289	2,598	0	9,871	4,530	102	254
Alta.	699	168	1,495	823	1,545	9,779	3,543	7,722	0	24,461	503	1,065
B.C.	462	148	1,500	657	2,122	12,090	2,980	3,436	16,780	0	928	389
Y.T.	6	5	23	6	37	139	34	91	401	950	0	106
N.W.T.	132	0	136	57	150	471	237	258	1,136	624	101	0
IN	6,406	2,514	15,299	10,853	23,056	66,902	15,890	16,814	51,247	70,783	2,067	3,137
OUT	13,380	2,165	18,040	11,666	32,003	69,743	19,110	20,466	51,803	41,492	1,798	3,302
NET	-6,974	349	-2,741	-813	-8,947	-2,841	-3,220	-3,652	-556	29,291	269	-165

1995/96	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	262	1,999	737	297	5,643	294	121	2,743	1,894	99	352
P.E.I.	151	0	556	359	62	589	21	44	236	205	7	14
N.S.	1,139	726	0	2,487	970	6,580	483	238	2,275	2,392	65	153
N.B.	425	498	2,328	0	1,978	3,870	302	153	1,371	1,110	30	74
Que.	219	141	1,002	2,014	0	22,702	614	301	2,675	5,271	68	175
Ont.	3,222	774	6,087	3,864	14,666	0	4,560	2,134	12,611	23,260	214	489
Man.	112	34	475	285	548	5,076	0	2,480	4,826	4,543	62	200
Sask.	40	28	264	129	313	2,236	2,386	0	9,808	4,067	100	201
Alta.	826	187	1,488	929	1,261	9,272	3,216	7,910	0	22,750	564	978
B.C.	718	215	1,893	862	2,277	12,423	2,920	3,631	18,763	0	839	393
Y.T.	14	4	25	15	25	163	18	100	402	837	0	36
N.W.T.	139	13	146	89	159	505	261	299	1,327	630	155	0
IN	7,005	2,882	16,263	11,770	22,556	69,059	15,075	17,411	57,037	66,959	2,203	3,065
OUT	14,441	2,244	17,508	12,139	35,182	71,881	18,641	19,572	49,381	44,934	1,639	3,723
NET	-7,436	638	-1,245	-369	-12,626	-2,822	-3,566	-2,161	7,656	22,025	564	-658

Research on modifications to the method of preliminary estimates of interprovincial migration
Table D3 (cont.)

1996/97	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	216	1,948	645	290	5,263	230	220	4,452	1,414	84	334
P.E.I.	196	0	612	369	105	643	43	21	381	175	3	10
N.S.	1,106	673	0	2,446	957	6,224	447	267	2,988	2,226	47	145
N.B.	489	472	2,329	0	1,772	3,869	269	155	1,986	1,060	17	75
Que.	219	113	1,017	2,156	0	24,388	626	279	3,944	4,949	61	121
Ont.	2,930	762	5,755	3,545	12,986	0	4,444	1,979	14,303	20,601	211	485
Man.	162	42	438	229	469	4,945	0	2,834	5,796	4,563	57	221
Sask.	59	20	273	114	267	2,124	2,101	0	10,635	3,720	75	177
Alta.	843	162	1,356	783	1,286	9,159	2,838	7,153	0	19,341	330	800
B.C.	755	202	1,941	825	2,146	12,704	2,631	3,418	23,673	0	850	407
Y.T.	29	8	32	28	36	159	51	85	646	816	0	69
N.W.T.	174	24	177	90	123	500	203	360	1,529	567	170	0
IN	6,962	2,694	15,878	11,230	20,437	69,978	13,883	16,771	70,333	59,432	1,905	2,844
OUT	15,096	2,558	17,526	12,493	37,873	68,001	19,756	19,565	44,051	49,552	1,959	3,917
NET	-8,134	136	-1,648	-1,263	-17,436	1,977	-5,873	-2,794	26,282	9,880	-54	-1,073

1997/98	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	243	2,012	644	236	5,679	266	298	6,099	1,037	45	323
P.E.I.	110	0	645	468	106	724	47	53	617	202	2	12
N.S.	1,176	571	0	2,321	781	6,850	447	364	4,143	1,982	46	192
N.B.	365	427	2,634	0	1,859	4,403	285	214	2,889	908	18	94
Que.	224	135	984	1,875	0	24,885	586	344	4,027	4,225	49	137
Ont.	2,983	718	5,631	3,307	12,749	0	4,608	2,067	15,679	17,606	172	465
Man.	152	35	414	255	458	5,072	0	3,081	6,651	3,847	47	170
Sask.	98	35	241	128	268	2,153	2,286	0	11,694	3,491	50	193
Alta.	1,249	203	1,627	914	1,333	9,524	2,843	7,843	0	16,663	262	757
B.C.	756	181	1,910	877	2,573	15,150	3,245	3,991	31,789	0	689	392
Y.T.	83	3	38	35	41	227	55	133	850	973	0	88
N.W.T.	196	19	168	80	109	549	238	309	1,869	590	122	0
IN	7,392	2,570	16,304	10,904	20,513	75,216	14,906	18,697	86,307	51,524	1,502	2,823
OUT	16,882	2,986	18,873	14,096	37,471	65,985	20,182	20,637	43,218	61,553	2,526	4,249
NET	-9,490	-416	-2,569	-3,192	-16,958	9,231	-5,276	-1,940	43,089	-10,029	-1,024	-1,426

1998/99	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	257	1,908	651	174	5,481	216	174	3,869	674	28	258
P.E.I.	101	0	588	387	85	665	24	33	360	119	11	13
N.S.	1,043	561	0	2,170	700	6,018	416	186	2,699	1,330	35	170
N.B.	318	395	2,365	0	1,813	3,881	224	168	1,839	617	22	72
Que.	216	107	931	1,604	0	22,691	548	237	2,920	3,159	43	115
Ont.	2,899	679	5,087	3,143	11,788	0	3,928	1,592	12,125	14,234	165	475
Man.	130	36	378	184	418	4,583	0	2,380	4,826	2,959	51	153
Sask.	131	32	275	133	259	2,275	2,289	0	10,895	2,976	51	217
Alta.	2,151	293	2,101	1,347	1,576	10,769	3,352	6,995	0	16,033	239	885
B.C.	782	197	1,708	741	2,541	15,733	2,717	3,182	29,195	0	581	407
Y.T.	44	13	32	32	41	226	71	75	700	735	0	84
N.W.T.	180	9	156	78	111	499	200	178	1,504	464	80	0
IN	7,995	2,579	15,529	10,470	19,506	72,821	13,985	15,200	70,932	43,300	1,306	2,849
OUT	13,690	2,386	15,328	11,714	32,571	56,115	16,098	19,533	45,741	57,784	2,053	3,459
NET	-5,695	193	201	-1,244	-13,065	16,706	-2,113	-4,333	25,191	-14,484	-747	-610

Research on modifications to the method of preliminary estimates of interprovincial migration

Table D3 (concl.)

1999/2000	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	233	1,915	663	186	5,412	200	137	3,102	508	25	282
P.E.I.	146	0	649	427	85	734	23	30	324	120	10	10
N.S.	1,159	680	0	2,353	937	6,791	392	199	2,570	1,289	13	159
N.B.	440	425	2,464	0	1,952	4,401	272	142	1,695	599	5	74
Que.	233	121	865	1,806	0	23,510	470	272	2,763	2,856	51	188
Ont.	3,262	660	5,428	3,332	12,561	0	3,965	1,510	11,490	13,770	155	401
Man.	164	41	432	255	486	5,141	0	2,335	5,362	3,100	40	175
Sask.	135	61	329	129	259	2,678	2,450	0	13,021	3,192	68	181
Alta.	1,906	254	2,164	1,426	1,703	12,415	3,200	6,911	0	16,915	282	871
B.C.	734	164	1,842	803	2,694	17,044	2,827	2,754	28,252	0	539	422
Y.T.	32	7	39	14	27	246	64	76	702	696	0	55
N.W.T.	189	16	145	78	99	531	212	190	1,440	420	79	0
IN	8,400	2,662	16,272	11,286	20,989	78,903	14,075	14,556	70,721	43,465	1,267	2,818
OUT	12,663	2,558	16,542	12,469	33,135	56,534	17,531	22,503	48,047	58,075	1,958	3,399
NET	-4,263	104	-270	-1,183	-12,146	22,369	-3,456	-7,947	22,674	-14,610	-691	-581

2000/01	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	208	1,817	713	219	5,003	194	145	2,836	540	7	310
P.E.I.	96	0	610	331	85	689	51	33	349	133	2	23
N.S.	1,118	613	0	2,438	848	7,291	357	322	2,745	1,402	38	218
N.B.	407	385	2,350	0	2,088	4,114	227	125	1,583	676	19	95
Que.	182	110	791	1,716	0	22,235	432	192	2,190	2,732	54	149
Ont.	3,096	673	5,439	3,195	13,113	0	3,811	1,456	10,358	14,147	168	437
Man.	142	40	380	222	479	5,180	0	2,066	5,100	3,121	37	179
Sask.	100	37	320	127	273	2,408	2,347	0	12,480	3,080	57	166
Alta.	1,593	255	1,853	1,098	1,760	11,002	2,786	5,857	0	16,428	260	780
B.C.	562	189	1,552	615	2,295	15,930	2,204	2,565	24,859	0	456	397
Y.T.	24	7	39	23	37	152	48	57	543	703	0	92
N.W.T.	179	50	162	61	144	512	166	167	1,086	376	55	0
IN	7,499	2,567	15,313	10,539	21,341	74,516	12,623	12,985	64,129	43,338	1,153	2,846
OUT	11,992	2,402	17,390	12,069	30,783	55,893	16,946	21,395	43,672	51,624	1,725	2,958
NET	-4,493	165	-2,077	-1,530	-9,442	18,623	-4,323	-8,410	20,457	-8,286	-572	-112

Research on modifications to the method of preliminary estimates of interprovincial migration
Table D4: Percentatge difference for preliminary modified (PM) and preliminary (P), out-migration, Canada, provinces and territories, 1994/95 to 2000/01 (PM out-migration based on regression)

1994/95 Prov./terr. (1)	Out-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	18,867	13,380	15,755	-2,375	-5,487	-17.75	-41.01
P.E.I.	2,623	2,165	2,190	-25	-458	-1.15	-21.15
N.S.	22,700	18,040	18,955	-915	-4,660	-5.07	-25.83
N.B.	16,130	11,666	13,469	-1,803	-4,464	-15.46	-38.27
Que.	43,042	32,003	35,940	-3,937	-11,039	-12.30	-34.49
Ont.	85,609	69,743	71,485	-1,742	-15,866	-2.50	-22.75
Man.	25,448	19,110	21,249	-2,139	-6,338	-11.19	-33.17
Sask.	27,689	20,466	23,121	-2,655	-7,223	-12.97	-35.29
Alta.	66,727	51,803	55,718	-3,915	-14,924	-7.56	-28.81
B.C.	55,130	41,492	46,035	-4,543	-13,638	-10.95	-32.87
Y.T.	2,289	1,798	1,912	-114	-491	-6.34	-27.31
N.W.T.	4,373	3,302	3,651	-349	-1,071	-10.57	-32.43
Canada	370,627	284,968	309,480	-24,512	-85,659	-8.60	-30.06
Average absolute percentage difference						9.48	31.12
sd of absolute percentage difference						5.06	6.06

1995/96 Prov./terr. (1)	Out-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	18,238	14,441	14,578	-137	-3,797	-0.95	-26.29
P.E.I.	2,602	2,244	2,079	165	-358	7.35	-15.95
N.S.	21,194	17,508	16,941	567	-3,686	3.24	-21.05
N.B.	14,835	12,139	11,858	281	-2,696	2.31	-22.21
Que.	41,307	35,182	33,017	2,165	-6,125	6.15	-17.41
Ont.	89,969	71,881	71,913	-32	-18,088	-0.04	-25.16
Man.	22,757	18,641	18,190	451	-4,116	2.42	-22.08
Sask.	24,219	19,572	19,359	213	-4,647	1.09	-23.74
Alta.	61,192	49,381	48,912	469	-11,811	0.95	-23.92
B.C.	57,681	44,934	46,105	-1,171	-12,747	-2.61	-28.37
Y.T.	2,073	1,639	1,657	-18	-434	-1.10	-26.48
N.W.T.	4,551	3,723	3,638	85	-828	2.28	-22.24
Canada	360,618	291,285	288,247	3,038	-69,333	1.04	-23.80
Average absolute percentage difference						2.54	22.91
sd of absolute percentage difference						2.18	3.62

Table D4 (cont.)

1996/97 Prov./terr. (1)	Out-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	20,196	15,096	15,857	-761	-5,100	-5.04	-33.78
P.E.I.	3,333	2,558	2,708	-150	-775	-5.86	-30.30
N.S.	19,846	17,526	15,583	1,943	-2,320	11.09	-13.24
N.B.	15,637	12,493	12,301	192	-3,144	1.54	-25.17
Que.	44,334	37,873	34,678	3,195	-6,461	8.44	-17.06
Ont.	86,704	68,001	67,716	285	-18,703	0.42	-27.50
Man.	21,727	19,756	17,050	2,706	-1,971	13.70	-9.98
Sask.	23,360	19,565	18,324	1,241	-3,795	6.34	-19.40
Alta.	54,065	44,051	42,265	1,786	-10,014	4.05	-22.73
B.C.	57,295	49,552	44,784	4,768	-7,743	9.62	-15.63
Y.T.	2,464	1,959	2,029	-70	-505	-3.57	-25.78
N.W.T.	4,188	3,917	3,374	543	-271	13.86	-6.92
Canada	353,149	292,347	276,669	15,678	-60,802	5.36	-20.80
Average absolute percentage difference						6.96	20.62
sd of absolute percentage difference						4.44	8.32

1997/98 Prov./terr. (1)	Out-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	21,251	16,882	17,192	-310	-4,369	-1.84	-25.88
P.E.I.	3,679	2,986	3,022	-36	-693	-1.21	-23.21
N.S.	23,055	18,873	18,647	226	-4,182	1.20	-22.16
N.B.	17,259	14,096	13,974	122	-3,163	0.87	-22.44
Que.	43,627	37,471	35,237	2,234	-6,156	5.96	-16.43
Ont.	79,018	65,985	63,778	2,207	-13,033	3.34	-19.75
Man.	23,073	20,182	18,662	1,520	-2,891	7.53	-14.32
Sask.	24,571	20,637	19,869	768	-3,934	3.72	-19.06
Alta.	50,442	43,218	40,733	2,485	-7,224	5.75	-16.72
B.C.	65,602	61,553	52,959	8,594	-4,049	13.96	-6.58
Y.T.	2,663	2,526	2,203	323	-137	12.79	-5.42
N.W.T.	4,590	4,249	3,757	492	-341	11.58	-8.03
Canada	358,830	308,658	290,033	18,625	-50,172	6.03	-16.25
Average absolute percentage difference						5.81	16.67
sd of absolute percentage difference						4.72	6.84

Table D4 (cont.)

1998/99 Prov./terr. (1)	Out-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	16,613	13,690	13,929	-239	-2,923	-1.75	-21.35
P.E.I.	2,816	2,386	2,361	25	-430	1.05	-18.02
N.S.	16,776	15,328	14,065	1,263	-1,448	8.24	-9.45
N.B.	13,637	11,714	11,433	281	-1,923	2.40	-16.42
Que.	39,908	32,571	33,460	-889	-7,337	-2.73	-22.53
Ont.	65,903	56,115	55,254	861	-9,788	1.53	-17.44
Man.	19,762	16,098	16,568	-470	-3,664	-2.92	-22.76
Sask.	25,093	19,533	21,038	-1,505	-5,560	-7.70	-28.46
Alta.	54,706	45,741	45,867	-126	-8,965	-0.28	-19.60
B.C.	71,969	57,784	60,340	-2,556	-14,185	-4.42	-24.55
Y.T.	2,878	2,053	2,413	-360	-825	-17.54	-40.19
N.W.T.	3,347	3,459	2,806	653	112	18.88	3.24
Canada	333,408	276,472	279,534	-3,062	-56,936	-1.11	-20.59
Average absolute percentage difference						5.79	20.33
sd of absolute percentage difference						6.30	9.20

1999/2000 Prov./terr. (1)	Out-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	14,119	12,663	12,051	612	-1,456	4.83	-11.50
P.E.I.	2,382	2,558	2,170	388	176	15.17	6.88
N.S.	17,985	16,542	15,305	1,237	-1,443	7.48	-8.72
N.B.	13,585	12,469	11,602	867	-1,116	6.95	-8.95
Que.	41,376	33,135	34,998	-1,863	-8,241	-5.62	-24.87
Ont.	71,529	56,534	60,383	-3,849	-14,995	-6.81	-26.52
Man.	20,244	17,531	17,208	323	-2,713	1.84	-15.48
Sask.	27,079	22,503	22,962	-459	-4,576	-2.04	-20.34
Alta.	60,892	48,047	51,428	-3,381	-12,845	-7.04	-26.73
B.C.	65,019	58,075	54,902	3,173	-6,944	5.46	-11.96
Y.T.	2,321	1,958	2,119	-161	-363	-8.22	-18.54
N.W.T.	2,965	3,399	2,662	737	434	21.68	12.77
Canada	339,496	285,414	287,790	-2,376	-54,082	-0.83	-18.95
average absolute percentage difference						7.76	16.10
sd of absolute percentage difference						5.54	7.15

Table D4 (concl.)

2000/01 Prov./terr.	Out-migration			Difference		% difference	
	P	F	PM	F-PM	F-P	PM	P
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
N.L.	14,152	11,992	12,038	-46	-2,160	-0.38	-18.01
P.E.I.	2,816	2,402	2,395	7	-414	0.29	-17.24
N.S.	19,156	17,390	16,294	1,096	-1,766	6.30	-10.16
N.B.	13,797	12,069	11,736	333	-1,728	2.76	-14.32
Que.	36,616	30,783	31,145	-362	-5,833	-1.18	-18.95
Ont.	67,884	55,893	57,741	-1,848	-11,991	-3.31	-21.45
Man.	20,656	16,946	17,570	-624	-3,710	-3.68	-21.89
Sask.	28,950	21,395	24,625	-3,230	-7,555	-15.10	-35.31
Alta.	53,623	43,672	45,611	-1,939	-9,951	-4.44	-22.79
B.C.	62,708	51,624	53,339	-1,715	-11,084	-3.32	-21.47
Y.T.	2,311	1,725	1,966	-241	-586	-13.97	-33.97
N.W.T.	3,907	2,958	3,322	-364	-949	-12.31	-32.08
Canada	326,576	268,849	277,782	-8,933	-57,727	-3.32	-21.47
Average absolute percentage difference						5.59	22.30
sd of absolute percentage difference						5.26	7.80

Note: PM out-migration is derived from regression using three-year pooling data.

Research on modifications to the method of preliminary estimates of interprovincial migration
Table D5: Percentage difference for preliminary modified (PM) and preliminary (P), in-migration, Canada, provinces and territories, 1994/95 to 2000/01 (PM in-migration based on regression)

1994/95 Prov./terr. (1)	In-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	10,457	6,406	8,731	-2,325	-4,051	-36.29	-63.24
P.E.I.	3,498	2,514	2,922	-408	-984	-16.23	-39.14
N.S.	19,883	15,299	16,602	-1,303	-4,584	-8.52	-29.96
N.B.	15,297	10,853	12,773	-1,920	-4,444	-17.69	-40.95
Que.	27,758	23,056	23,178	-122	-4,702	-0.53	-20.39
Ont.	90,211	66,902	75,329	-8,427	-23,309	-12.60	-34.84
Man.	23,286	15,890	19,444	-3,554	-7,396	-22.37	-46.54
Sask.	23,522	16,814	19,642	-2,828	-6,708	-16.82	-39.90
Alta.	62,649	51,247	52,313	-1,066	-11,402	-2.08	-22.25
B.C.	87,542	70,783	73,099	-2,316	-16,759	-3.27	-23.68
Y.T.	2,383	2,067	1,989	78	-316	3.77	-15.29
N.W.T.	4,141	3,137	3,458	-321	-1,004	-10.23	-32.01
Canada	370,627	284,968	309,480	-24,512	-85,659	-8.60	-30.06
Average absolute percentage difference						12.53	34.02
sd of absolute percentage difference						10.26	13.22

1995/96 Prov./terr. (1)	In-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	10,665	7,005	8,525	-1,520	-3,660	-21.70	-52.25
P.E.I.	3,482	2,882	2,784	98	-600	3.40	-20.82
N.S.	20,301	16,263	16,227	36	-4,038	0.22	-24.83
N.B.	14,607	11,770	11,675	95	-2,837	0.81	-24.10
Que.	28,090	22,556	22,452	104	-5,534	0.46	-24.53
Ont.	84,390	69,059	67,454	1,605	-15,331	2.32	-22.20
Man.	20,811	15,075	16,635	-1,560	-5,736	-10.35	-38.05
Sask.	23,476	17,411	18,765	-1,354	-6,065	-7.78	-34.83
Alta.	66,931	57,037	53,499	3,538	-9,894	6.20	-17.35
B.C.	81,141	66,959	64,857	2,102	-14,182	3.14	-21.18
Y.T.	2,874	2,203	2,297	-94	-671	-4.27	-30.46
N.W.T.	3,850	3,065	3,077	-12	-785	-0.39	-25.61
Canada	360,618	291,285	288,247	3,038	-69,333	1.04	-23.80
Average absolute percentage difference						5.09	28.02
sd of absolute percentage difference						6.12	9.68

Table D5 (cont.)

1996/97 Prov./terr. (1)	In-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	10,911	6,962	8,548	-1,586	-3,949	-22.78	-56.72
P.E.I.	3,277	2,694	2,567	127	-583	4.71	-21.64
N.S.	19,703	15,878	15,436	442	-3,825	2.78	-24.09
N.B.	13,726	11,230	10,754	476	-2,496	4.24	-22.23
Que.	27,709	20,437	21,708	-1,271	-7,272	-6.22	-35.58
Ont.	81,884	69,978	64,151	5,827	-11,906	8.33	-17.01
Man.	17,946	13,883	14,059	-176	-4,063	-1.27	-29.27
Sask.	21,774	16,771	17,059	-288	-5,003	-1.72	-29.83
Alta.	78,779	70,333	61,718	8,615	-8,446	12.25	-12.01
B.C.	71,582	59,432	56,080	3,352	-12,150	5.64	-20.44
Y.T.	2,332	1,905	1,827	78	-427	4.09	-22.41
N.W.T.	3,526	2,844	2,762	82	-682	2.88	-23.98
Canada	353,149	292,347	276,669	15,678	-60,802	5.36	-20.80
Average absolute percentage difference						6.41	26.27
sd of absolute percentage difference						5.98	11.37

1997/98 Prov./terr. (1)	In-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	9,817	7,392	7,935	-543	-2,425	-7.35	-32.81
P.E.I.	2,828	2,570	2,286	284	-258	11.05	-10.04
N.S.	18,015	16,304	14,561	1,743	-1,711	10.69	-10.49
N.B.	14,203	10,904	11,480	-576	-3,299	-5.28	-30.25
Que.	26,173	20,513	21,155	-642	-5,660	-3.13	-27.59
Ont.	85,680	75,216	69,253	5,963	-10,464	7.93	-13.91
Man.	17,690	14,906	14,299	607	-2,784	4.07	-18.68
Sask.	21,204	18,697	17,139	1,558	-2,507	8.33	-13.41
Alta.	97,229	86,307	78,587	7,720	-10,922	8.94	-12.65
B.C.	61,372	51,524	49,605	1,919	-9,848	3.72	-19.11
Y.T.	1,734	1,502	1,401	101	-232	6.72	-15.45
N.W.T.	2,885	2,823	2,332	491	-62	17.39	-2.20
Canada	358,830	308,658	290,033	18,625	-50,172	6.03	-16.25
Average absolute percentage difference						7.88	17.22
sd of absolute percentage difference						3.96	9.04

Table D5 (cont.)

1998/99 Prov./terr. (1)	In-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	10,988	7,995	9,213	-1,218	-2,993	-15.23	-37.44
P.E.I.	2,982	2,579	2,500	79	-403	3.06	-15.63
N.S.	17,035	15,529	14,283	1,246	-1,506	8.02	-9.70
N.B.	12,706	10,470	10,653	-183	-2,236	-1.75	-21.36
Que.	24,226	19,506	20,311	-805	-4,720	-4.13	-24.20
Ont.	82,865	72,821	69,476	3,345	-10,044	4.59	-13.79
Man.	18,430	13,985	15,452	-1,467	-4,445	-10.49	-31.78
Sask.	22,533	15,200	18,892	-3,692	-7,333	-24.29	-48.24
Alta.	85,770	70,932	71,911	-979	-14,838	-1.38	-20.92
B.C.	50,866	43,300	42,646	654	-7,566	1.51	-17.47
Y.T.	1,606	1,306	1,346	-40	-300	-3.06	-22.97
N.W.T.	3,401	2,849	2,851	-2	-552	-0.07	-19.38
Canada	333,408	276,472	279,534	-3,062	-56,936	-1.11	-20.59
Average absolute percentage difference						6.47	23.57
sd of absolute percentage difference						7.13	10.82

1999/2000 Prov./terr. (1)	In-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	11,609	8,400	9,841	-1,441	-3,209	-17.15	-38.20
P.E.I.	3,361	2,662	2,849	-187	-699	-7.02	-26.26
N.S.	18,650	16,272	15,810	462	-2,378	2.84	-14.61
N.B.	14,109	11,286	11,960	-674	-2,823	-5.97	-25.01
Que.	25,033	20,989	21,220	-231	-4,044	-1.10	-19.27
Ont.	91,347	78,903	77,435	1,468	-12,444	1.86	-15.77
Man.	18,954	14,075	16,067	-1,992	-4,879	-14.15	-34.66
Sask.	20,781	14,556	17,616	-3,060	-6,225	-21.02	-42.77
Alta.	72,685	70,721	61,615	9,106	-1,964	12.88	-2.78
B.C.	57,866	43,465	49,053	-5,588	-14,401	-12.86	-33.13
Y.T.	1,679	1,267	1,423	-156	-412	-12.31	-32.52
N.W.T.	3,422	2,818	2,901	-83	-604	-2.95	-21.43
Canada	339,496	285,414	287,790	-2,376	-54,082	-0.83	-18.95
Average absolute percentage difference						9.34	25.53
sd of absolute percentage difference						6.59	11.43

Table D5 (concl.)

2000/01 Prov./terr. (1)	In-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	10,611	7,499	9,026	-1,527	-3,112	-20.36	-41.50
P.E.I.	2,887	2,567	2,456	111	-320	4.32	-12.47
N.S.	18,332	15,313	15,592	-279	-3,019	-1.82	-19.72
N.B.	13,716	10,539	11,667	-1,128	-3,177	-10.70	-30.15
Que.	24,834	21,341	21,124	217	-3,493	1.02	-16.37
Ont.	85,761	74,516	72,947	1,569	-11,245	2.11	-15.09
Man.	17,562	12,623	14,938	-2,315	-4,939	-18.34	-39.13
Sask.	18,497	12,985	15,733	-2,748	-5,512	-21.16	-42.45
Alta.	79,371	64,129	67,512	-3,383	-15,242	-5.28	-23.77
B.C.	50,019	43,338	42,546	792	-6,681	1.83	-15.42
Y.T.	1,465	1,153	1,246	-93	-312	-8.07	-27.06
N.W.T.	3,521	2,846	2,995	-149	-675	-5.24	-23.72
Canada	326,576	268,849	277,782	-8,933	-57,727	-3.32	-21.47
Average absolute percentage difference						8.35	25.57
sd of absolute percentage difference						7.55	10.68

Note: PM in-migration is derived from regression using three-year pooling data.

Table D6: Preliminary modified (PM) interprovincial migration matrix, 1993/94 to 2000/01, based on origin-constrained model to redistribute PM out-migration

1994/95	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	292	2,701	814	441	6,638	269	137	1,831	2,201	56	374
P.E.I.	99	0	519	352	98	614	23	48	199	234	1	3
N.S.	1,291	705	0	2,696	1,041	6,929	536	256	1,917	3,339	28	216
N.B.	436	482	2,826	0	2,237	4,254	338	161	1,307	1,318	12	98
Que.	346	145	1,098	2,114	0	23,236	577	285	2,096	5,851	56	136
Ont.	2,989	847	5,547	3,355	15,279	0	4,458	2,302	11,516	24,467	158	568
Man.	170	39	453	365	619	5,288	0	2,763	4,933	6,321	55	244
Sask.	90	49	271	105	349	2,234	2,655	0	11,322	5,666	97	283
Alta.	753	183	1,383	775	1,596	10,129	3,625	8,110	0	27,679	368	1,117
B.C.	484	165	1,748	793	2,436	12,957	3,296	3,518	19,404	0	783	450
Y.T.	44	4	34	16	20	114	56	86	440	1,035	0	64
N.W.T.	115	20	148	105	199	481	270	266	1,252	675	121	0
IN	6,817	2,931	16,728	11,490	24,315	72,874	16,103	17,932	56,217	78,786	1,735	3,553
OUT	15,754	2,190	18,954	13,469	35,940	71,486	21,250	23,121	55,718	46,034	1,913	3,652
NET	-8,937	741	-2,226	-1,979	-11,625	1,388	-5,147	-5,189	499	32,752	-178	-99

1995/96	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	236	2,047	684	268	6,259	297	108	2,144	2,162	64	307
P.E.I.	77	0	496	339	63	602	35	33	219	199	3	13
N.S.	1,182	604	0	2,359	924	6,052	526	263	2,042	2,784	53	151
N.B.	387	397	2,322	0	2,040	3,734	327	143	1,211	1,192	18	85
Que.	315	104	1,039	1,938	0	21,318	624	322	1,845	5,332	40	141
Ont.	2,970	790	5,935	3,603	15,504	0	4,848	2,019	11,293	24,262	224	466
Man.	114	24	434	269	553	4,740	0	2,363	4,528	4,941	39	184
Sask.	78	47	233	153	267	2,165	2,457	0	9,337	4,285	96	240
Alta.	660	159	1,412	777	1,459	9,233	3,345	7,291	0	23,096	475	1,006
B.C.	513	164	1,667	730	2,358	13,434	3,311	3,818	18,646	0	1,031	432
Y.T.	6	5	21	6	34	128	31	84	370	876	0	98
N.W.T.	145	0	150	63	165	519	261	284	1,252	687	111	0
IN	6,447	2,530	15,756	10,921	23,635	68,184	16,062	16,728	52,887	69,816	2,154	3,123
OUT	14,576	2,079	16,940	11,856	33,018	71,914	18,189	19,358	48,913	46,104	1,659	3,637
NET	-8,129	451	-1,184	-935	-9,383	-3,730	-2,127	-2,630	3,974	23,712	495	-514

1996/97	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	288	2,195	809	326	6,196	323	133	3,012	2,080	109	387
P.E.I.	182	0	671	433	75	711	25	53	285	247	8	17
N.S.	1,014	646	0	2,214	863	5,857	430	212	2,025	2,129	58	136
N.B.	431	505	2,359	0	2,004	3,922	306	155	1,389	1,125	30	75
Que.	216	139	988	1,985	0	22,377	605	297	2,637	5,195	67	172
Ont.	3,035	729	5,734	3,640	13,816	0	4,296	2,010	11,880	21,912	202	461
Man.	102	31	434	261	501	4,643	0	2,268	4,414	4,155	57	183
Sask.	37	26	247	121	293	2,093	2,234	0	9,183	3,808	94	188
Alta.	707	160	1,274	795	1,079	7,936	2,753	6,770	0	19,472	483	837
B.C.	716	214	1,887	859	2,269	12,382	2,910	3,619	18,700	0	836	392
Y.T.	17	5	31	19	31	202	22	124	498	1,036	0	45
N.W.T.	126	12	132	81	144	458	237	271	1,203	571	140	0
IN	6,583	2,755	15,952	11,217	21,401	66,777	14,141	15,912	55,226	61,730	2,084	2,893
OUT	15,858	2,707	15,584	12,301	34,678	67,715	17,049	18,324	42,266	44,784	2,030	3,375
NET	-9,275	48	368	-1,084	-13,277	-938	-2,908	-2,412	12,960	16,946	54	-482

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Table D6 (cont.)

1997/98	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	246	2,218	735	330	5,994	262	251	5,070	1,610	96	380
P.E.I.	232	0	723	436	124	760	51	25	450	207	4	12
N.S.	1,177	716	0	2,602	1,018	6,622	476	284	3,179	2,368	50	154
N.B.	547	528	2,605	0	1,982	4,328	301	173	2,221	1,186	19	84
Que.	204	105	946	2,006	0	22,691	582	260	3,669	4,605	57	113
Ont.	2,748	715	5,398	3,325	12,180	0	4,168	1,856	13,415	19,322	198	455
Man.	153	40	414	216	443	4,671	0	2,677	5,475	4,310	54	209
Sask.	60	20	277	116	271	2,157	2,134	0	10,800	3,778	76	180
Alta.	780	150	1,254	724	1,189	8,469	2,624	6,614	0	17,884	305	740
B.C.	807	216	2,074	882	2,294	13,577	2,812	3,653	25,301	0	908	435
Y.T.	33	9	36	31	40	179	57	96	726	918	0	78
N.W.T.	167	23	170	86	118	480	195	345	1,467	544	163	0
IN	6,908	2,768	16,115	11,159	19,989	69,928	13,662	16,234	71,773	56,732	1,930	2,840
OUT	17,192	3,024	18,646	13,974	35,238	63,780	18,662	19,869	40,733	52,959	2,203	3,758
NET	-10,284	-256	-2,531	-2,815	-15,249	6,148	-5,000	-3,635	31,040	3,773	-273	-918

1998/99	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	200	1,660	531	195	4,686	219	246	5,032	856	37	267
P.E.I.	87	0	510	370	84	572	37	42	488	160	2	9
N.S.	876	426	0	1,730	582	5,105	333	271	3,088	1,477	34	143
N.B.	296	346	2,136	0	1,508	3,571	231	174	2,343	736	15	76
Que.	200	121	879	1,674	0	22,221	523	307	3,596	3,773	44	122
Ont.	2,498	601	4,715	2,769	10,676	0	3,859	1,731	13,129	14,743	144	389
Man.	125	29	340	209	376	4,164	0	2,529	5,460	3,158	39	140
Sask.	100	36	246	130	273	2,195	2,330	0	11,921	3,559	51	197
Alta.	1,326	215	1,727	970	1,415	10,108	3,017	8,324	0	17,684	278	803
B.C.	741	177	1,872	860	2,522	14,851	3,181	3,912	31,163	0	675	384
Y.T.	79	3	36	33	39	217	53	127	812	929	0	84
N.W.T.	129	13	111	53	72	363	157	204	1,234	390	81	0
IN	6,457	2,167	14,232	9,329	17,742	68,053	13,940	17,867	78,266	47,465	1,400	2,614
OUT	13,929	2,361	14,065	11,432	33,460	55,254	16,569	21,038	45,867	60,338	2,412	2,807
NET	-7,472	-194	167	-2,103	-15,718	12,799	-2,629	-3,171	32,399	-12,873	-1,012	-193

1999/2000	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	226	1,680	573	153	4,825	190	153	3,406	593	25	227
P.E.I.	92	0	535	352	77	605	22	30	327	108	10	12
N.S.	1,041	560	0	2,167	699	6,009	415	186	2,695	1,328	35	170
N.B.	315	391	2,342	0	1,796	3,844	222	166	1,821	611	22	71
Que.	232	115	1,000	1,724	0	24,382	589	255	3,138	3,394	46	124
Ont.	3,119	731	5,474	3,382	12,685	0	4,227	1,713	13,047	15,317	178	511
Man.	139	38	404	197	447	4,899	0	2,544	5,159	3,163	55	164
Sask.	154	38	323	156	304	2,674	2,691	0	12,808	3,498	60	255
Alta.	2,418	329	2,362	1,514	1,772	12,108	3,769	7,865	0	18,026	269	995
B.C.	743	187	1,623	704	2,414	14,948	2,581	3,023	27,739	0	552	387
Y.T.	45	13	33	33	42	233	73	77	723	759	0	87
N.W.T.	139	7	120	60	85	384	154	137	1,157	357	62	0
IN	8,437	2,635	15,896	10,862	20,474	74,911	14,933	16,149	72,020	47,154	1,314	3,003
OUT	12,051	2,170	15,305	11,601	34,999	60,384	17,209	22,961	51,427	54,901	2,118	2,662
NET	-3,614	465	591	-739	-14,525	14,527	-2,276	-6,812	20,593	-7,747	-804	341

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Table D6 (concl.)

2000/01	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.
N.L.	0	221	1,820	630	177	5,145	190	130	2,949	483	24	268
P.E.I.	137	0	608	400	80	687	22	28	303	112	9	9
N.S.	1,142	670	0	2,318	923	6,689	386	196	2,531	1,270	13	157
N.B.	414	400	2,319	0	1,837	4,142	256	134	1,595	564	5	70
Que.	219	114	813	1,698	0	22,098	442	256	2,597	2,684	48	177
Ont.	3,332	674	5,544	3,403	12,829	0	4,050	1,542	11,735	14,064	158	410
Man.	164	41	433	256	487	5,152	0	2,340	5,374	3,107	40	175
Sask.	148	67	360	141	283	2,931	2,681	0	14,249	3,493	74	198
Alta.	1,809	241	2,054	1,354	1,617	11,786	3,038	6,561	0	16,057	268	827
B.C.	674	151	1,692	738	2,474	15,654	2,596	2,529	25,948	0	495	388
Y.T.	32	7	39	14	27	247	64	76	705	699	0	55
N.W.T.	185	16	142	76	97	519	207	186	1,407	410	77	0
IN	8,256	2,602	15,824	11,028	20,831	75,050	13,932	13,978	69,393	42,943	1,211	2,734
OUT	12,037	2,395	16,295	11,736	31,146	57,741	17,569	24,625	45,612	53,339	1,965	3,322
NET	-3,781	207	-471	-708	-10,315	17,309	-3,637	-10,647	23,781	-10,396	-754	-588

Note: these PM migration matrices are estimated based on the origin-constrained model to redistribute PM out-migration.

Table D7: Preliminary modified in-migration derived from PM out-migration and PM net migration (in = out + net), 1994/95 to 2000/01

1994/95 Prov./terr. (1)	Preliminary modified migration		
	Out (2)	Net (3)	In (4)=(2)+(3)
N.L.	15,755	-7,893	7,862
P.E.I.	2,190	821	3,011
N.S.	18,955	-2,644	16,311
N.B.	13,469	-782	12,687
Que.	35,940	-14,345	21,595
Ont.	71,485	4,319	75,804
Man.	21,249	-2,029	19,220
Sask.	23,121	-3,911	19,210
Alta.	55,718	-3,827	51,891
B.C.	46,035	30,421	76,456
Y.T.	1,912	88	2,000
N.W.T.	3,651	-218	3,433
Canada	309,480	0	309,480

1995/96 Prov./terr. (1)	Preliminary modified migration		
	Out (2)	Net (3)	In (4)=(2)+(3)
N.L.	14,578	-6,720	7,858
P.E.I.	2,079	781	2,860
N.S.	16,941	-792	16,149
N.B.	11,858	-202	11,656
Que.	33,017	-11,728	21,289
Ont.	71,913	-4,950	66,963
Man.	18,190	-1,727	16,463
Sask.	19,359	-659	18,700
Alta.	48,912	5,092	54,004
B.C.	46,105	20,817	66,922
Y.T.	1,657	711	2,368
N.W.T.	3,638	-622	3,016
Canada	288,247	0	288,247

1996/97 Prov./terr. (1)	Preliminary modified migration		
	Out (2)	Net (3)	In (4)=(2)+(3)
N.L.	15,857	-8,161	7,696
P.E.I.	2,708	-49	2,659
N.S.	15,583	-126	15,457
N.B.	12,301	-1,680	10,621
Que.	34,678	-14,613	20,065
Ont.	67,716	-4,237	63,479
Man.	17,050	-3,323	13,727
Sask.	18,324	-1,394	16,930
Alta.	42,265	21,723	63,988
B.C.	44,784	12,558	57,342
Y.T.	2,029	-116	1,913
N.W.T.	3,374	-582	2,792
Canada	276,669	0	276,669

Research on modifications to the method of preliminary estimates of interprovincial migration
Table D7 (cont.)

1997/98		Preliminary modified migration		
Prov./terr.	Out	Net	In	
(1)	(2)	(3)	(4)=(2)+(3)	
N.L.	17,192	-10,300	6,892	
P.E.I.	3,022	-767	2,255	
N.S.	18,647	-4,540	14,107	
N.B.	13,974	-2,753	11,221	
Que.	35,237	-15,723	19,514	
Ont.	63,778	6,001	69,779	
Man.	18,662	-4,849	13,813	
Sask.	19,869	-3,033	16,836	
Alta.	40,733	42,146	82,879	
B.C.	52,959	-3,810	49,149	
Y.T.	2,203	-837	1,366	
N.W.T.	3,757	-1,536	2,221	
Canada	290,033	0	290,033	
1998/99		Preliminary modified migration		
Prov./terr.	Out	Net	In	
(1)	(2)	(3)	(4)=(2)+(3)	
N.L.	13,929	-5,313	8,616	
P.E.I.	2,361	157	2,518	
N.S.	14,065	245	14,310	
N.B.	11,433	-879	10,554	
Que.	33,460	-14,813	18,647	
Ont.	55,254	16,022	71,276	
Man.	16,568	-1,258	15,310	
Sask.	21,038	-2,418	18,620	
Alta.	45,867	29,342	75,209	
B.C.	60,340	-19,933	40,407	
Y.T.	2,413	-1,202	1,211	
N.W.T.	2,806	51	2,857	
Canada	279,534	0	279,534	
1999/2000		Preliminary modified migration		
Prov./terr.	Out	Net	In	
(1)	(2)	(3)	(4)=(2)+(3)	
N.L.	12,051	-2,263	9,788	
P.E.I.	2,170	883	3,053	
N.S.	15,305	600	15,905	
N.B.	11,602	472	12,074	
Que.	34,998	-14,736	20,262	
Ont.	60,383	17,869	78,252	
Man.	17,208	-1,163	16,045	
Sask.	22,962	-5,679	17,283	
Alta.	51,428	10,633	62,061	
B.C.	54,902	-6,450	48,452	
Y.T.	2,119	-579	1,540	
N.W.T.	2,662	412	3,074	
Canada	287,790	0	287,790	

Table D7 (concl.)

2000/01 Prov./terr. (1)	Preliminary modified migration		
	Out (2)	Net (3)	In (4)=(2)+(3)
N.L.	12,038	-3,313	8,725
P.E.I.	2,395	66	2,461
N.S.	16,294	-771	15,523
N.B.	11,736	-76	11,660
Que.	31,145	-11,023	20,122
Ont.	57,741	16,726	74,467
Man.	17,570	-2,895	14,675
Sask.	24,625	-9,780	14,845
Alta.	45,611	24,090	69,701
B.C.	53,339	-11,872	41,467
Y.T.	1,966	-792	1,174
N.W.T.	3,322	-361	2,961
Canada	277,782	0	277,782

Note: PM out and PM net are from regression using three-year pooling data.

Research on modifications to the method of preliminary estimates of interprovincial migration

Table D8: Percentage difference for preliminary modified (PM) and preliminary (P), in-migration (in = out + net), Canada, provinces and territories, 1994/95 to 2000/01

1994/95 Prov./terr.	In-migration			Difference		% difference	
	P (1)	F (2)	PM (3)	F-PM (4)	F-P (5)	PM (6)	P (7)
N.L.	10,457	6,406	7,862	-1,456	-4,051	-22.73	-63.24
P.E.I.	3,498	2,514	3,011	-497	-984	-19.77	-39.14
N.S.	19,883	15,299	16,311	-1,012	-4,584	-6.61	-29.96
N.B.	15,297	10,853	12,687	-1,834	-4,444	-16.90	-40.95
Que.	27,758	23,056	21,595	1,461	-4,702	6.34	-20.39
Ont.	90,211	66,902	75,804	-8,902	-23,309	-13.31	-34.84
Man.	23,286	15,890	19,220	-3,330	-7,396	-20.96	-46.54
Sask.	23,522	16,814	19,210	-2,396	-6,708	-14.25	-39.90
Alta.	62,649	51,247	51,891	-644	-11,402	-1.26	-22.25
B.C.	87,542	70,783	76,456	-5,673	-16,759	-8.01	-23.68
Y.T.	2,383	2,067	2,000	67	-316	3.24	-15.29
N.W.T.	4,141	3,137	3,433	-296	-1,004	-9.44	-32.01
Canada	370,627	284,968	309,480	-24,512	-85,659	-8.60	-30.06
Average absolute percentage difference						11.90	34.02
sd of absolute percentage difference						7.15	13.22

1995/96 Prov./terr.	In-migration			Difference		% difference	
	P (1)	F (2)	PM (3)	F-PM (4)	F-P (5)	PM (6)	P (7)
N.L.	10,665	7,005	7,858	-853	-3,660	-12.18	-52.25
P.E.I.	3,482	2,882	2,860	22	-600	0.76	-20.82
N.S.	20,301	16,263	16,149	114	-4,038	0.70	-24.83
N.B.	14,607	11,770	11,656	114	-2,837	0.97	-24.10
Que.	28,090	22,556	21,289	1,267	-5,534	5.62	-24.53
Ont.	84,390	69,059	66,963	2,096	-15,331	3.04	-22.20
Man.	20,811	15,075	16,463	-1,388	-5,736	-9.21	-38.05
Sask.	23,476	17,411	18,700	-1,289	-6,065	-7.40	-34.83
Alta.	66,931	57,037	54,004	3,033	-9,894	5.32	-17.35
B.C.	81,141	66,959	66,921	38	-14,182	0.06	-21.18
Y.T.	2,874	2,203	2,368	-165	-671	-7.49	-30.46
N.W.T.	3,850	3,065	3,016	49	-785	1.60	-25.61
Canada	360,618	291,285	288,247	3,038	-69,333	1.04	-23.80
Average absolute percentage difference						4.53	28.02
sd of absolute percentage difference						3.95	9.68

1996/97 Prov./terr.	In-migration			Difference		% difference	
	P (1)	F (2)	PM (3)	F-PM (4)	F-P (5)	PM (6)	P (7)
N.L.	10,911	6,962	7,696	-734	-3,949	-10.54	-56.72
P.E.I.	3,277	2,694	2,659	35	-583	1.30	-21.64
N.S.	19,703	15,878	15,457	421	-3,825	2.65	-24.09
N.B.	13,726	11,230	10,621	609	-2,496	5.42	-22.23
Que.	27,709	20,437	20,065	372	-7,272	1.82	-35.58
Ont.	81,884	69,978	63,479	6,499	-11,906	9.29	-17.01
Man.	17,946	13,883	13,727	156	-4,063	1.12	-29.27
Sask.	21,774	16,771	16,930	-159	-5,003	-0.95	-29.83
Alta.	78,779	70,333	63,988	6,345	-8,446	9.02	-12.01
B.C.	71,582	59,432	57,342	2,090	-12,150	3.52	-20.44
Y.T.	2,332	1,905	1,913	-8	-427	-0.42	-22.41
N.W.T.	3,526	2,844	2,792	52	-682	1.83	-23.98
Canada	353,149	292,347	276,669	15,678	-60,802	5.36	-20.80
Average absolute percentage difference						3.99	26.27
sd of absolute percentage difference						3.66	11.37

Research on modifications to the method of preliminary estimates of interprovincial migration

Table D8 (cont.)

1997/98 Prov./terr. (1)	In-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	9,817	7,392	6,892	500	-2,425	6.76	-32.81
P.E.I.	2,828	2,570	2,255	315	-258	12.26	-10.04
N.S.	18,015	16,304	14,107	2,197	-1,711	13.48	-10.49
N.B.	14,203	10,904	11,221	-317	-3,299	-2.91	-30.25
Que.	26,173	20,513	19,514	999	-5,660	4.87	-27.59
Ont.	85,680	75,216	69,779	5,437	-10,464	7.23	-13.91
Man.	17,690	14,906	13,813	1,093	-2,784	7.33	-18.68
Sask.	21,204	18,697	16,837	1,860	-2,507	9.95	-13.41
Alta.	97,229	86,307	82,879	3,428	-10,922	3.97	-12.65
B.C.	61,372	51,524	49,149	2,375	-9,848	4.61	-19.11
Y.T.	1,734	1,502	1,366	136	-232	9.05	-15.45
N.W.T.	2,885	2,823	2,221	602	-62	21.32	-2.20
Canada	358,830	308,658	290,033	18,625	-50,172	6.03	-16.25
Average absolute percentage difference						8.65	17.22
sd of absolute percentage difference						5.15	9.04

1998/99 Prov./terr. (1)	In-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	10,988	7,995	8,616	-621	-2,993	-7.77	-37.44
P.E.I.	2,982	2,579	2,518	61	-403	2.37	-15.63
N.S.	17,035	15,529	14,310	1,219	-1,506	7.85	-9.70
N.B.	12,706	10,470	10,554	-84	-2,236	-0.80	-21.36
Que.	24,226	19,506	18,647	859	-4,720	4.40	-24.20
Ont.	82,865	72,821	71,276	1,545	-10,044	2.12	-13.79
Man.	18,430	13,985	15,310	-1,325	-4,445	-9.47	-31.78
Sask.	22,533	15,200	18,620	-3,420	-7,333	-22.50	-48.24
Alta.	85,770	70,932	75,209	-4,277	-14,838	-6.03	-20.92
B.C.	50,866	43,300	40,407	2,893	-7,566	6.68	-17.47
Y.T.	1,606	1,306	1,211	95	-300	7.27	-22.97
N.W.T.	3,401	2,849	2,856	-7	-552	-0.25	-19.38
Canada	333,408	276,472	279,534	-3,062	-56,936	-1.11	-20.59
Average absolute percentage difference						6.46	23.57
sd of absolute percentage difference						5.88	10.82

1999/2000 Prov./terr. (1)	In-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	11,609	8,400	9,788	-1,388	-3,209	-16.52	-38.20
P.E.I.	3,361	2,662	3,053	-391	-699	-14.69	-26.26
N.S.	18,650	16,272	15,905	367	-2,378	2.26	-14.61
N.B.	14,109	11,286	12,075	-789	-2,823	-6.99	-25.01
Que.	25,033	20,989	20,262	727	-4,044	3.46	-19.27
Ont.	91,347	78,903	78,252	651	-12,444	0.83	-15.77
Man.	18,954	14,075	16,045	-1,970	-4,879	-14.00	-34.66
Sask.	20,781	14,556	17,283	-2,727	-6,225	-18.73	-42.77
Alta.	72,685	70,721	62,061	8,660	-1,964	12.25	-2.78
B.C.	57,866	43,465	48,452	-4,987	-14,401	-11.47	-33.13
Y.T.	1,679	1,267	1,540	-273	-412	-21.55	-32.52
N.W.T.	3,422	2,818	3,074	-256	-604	-9.08	-21.43
Canada	339,496	285,414	287,790	-2,376	-54,082	-0.83	-18.95
Average absolute percentage difference						10.99	25.53
sd of absolute percentage difference						6.62	11.43

Research on modifications to the method of preliminary estimates of interprovincial migration

Table D8 (concl.)

2000/01 Prov./terr. (1)	In-migration			Difference		% difference	
	P (2)	F (3)	PM (4)	F-PM (5)	F-P (6)	PM (7)	P (8)
N.L.	10,611	7,499	8,725	-1,226	-3,112	-16.35	-41.50
P.E.I.	2,887	2,567	2,462	105	-320	4.09	-12.47
N.S.	18,332	15,313	15,523	-210	-3,019	-1.37	-19.72
N.B.	13,716	10,539	11,660	-1,121	-3,177	-10.64	-30.15
Que.	24,834	21,341	20,122	1,219	-3,493	5.71	-16.37
Ont.	85,761	74,516	74,467	49	-11,245	0.07	-15.09
Man.	17,562	12,623	14,675	-2,052	-4,939	-16.26	-39.13
Sask.	18,497	12,985	14,845	-1,860	-5,512	-14.32	-42.45
Alta.	79,371	64,129	69,701	-5,572	-15,242	-8.69	-23.77
B.C.	50,019	43,338	41,467	1,871	-6,681	4.32	-15.42
Y.T.	1,465	1,153	1,174	-21	-312	-1.82	-27.06
N.W.T.	3,521	2,846	2,961	-115	-675	-4.04	-23.72
Canada	326,576	268,849	277,782	-8,933	-57,727	-3.32	-21.47
Average absolute percentage difference						7.31	25.57
sd of absolute percentage difference						5.83	10.68

Note: PM in-migration is the sum of PM out-migration and PM net-migration